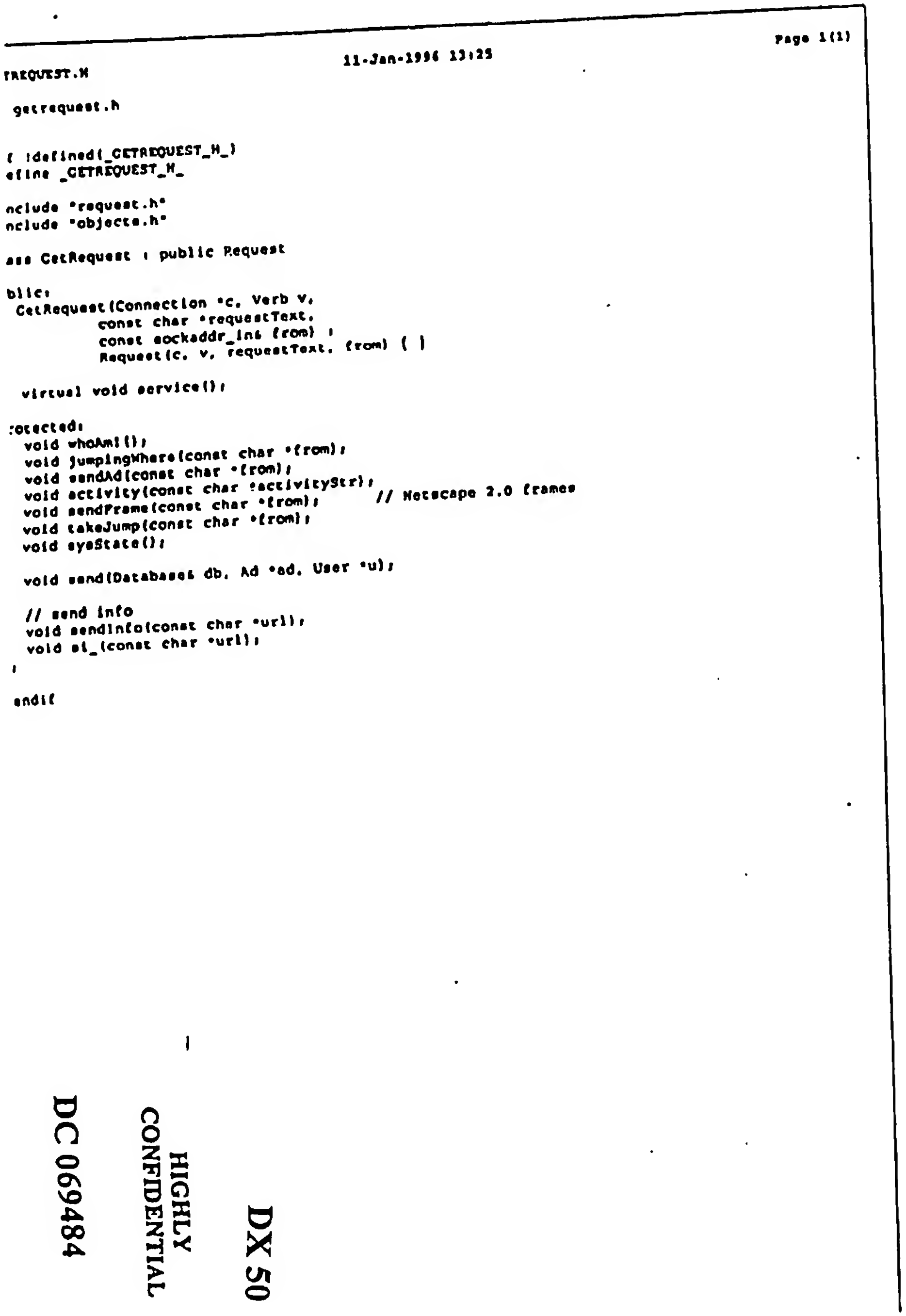
Exhibit A



```
                                                          Page 1(1)
TREQUEST.H                        11-Jan-1996 13:25

 getrequest.h


( !defined(_GETREQUEST_H_)
efine _GETREQUEST_H_

nclude "request.h"
nclude "objects.h"

ass GetRequest : public Request

blic:
 GetRequest(Connection *c, Verb v,
           const char *requestText,
           const sockaddr_in& from) :
           Request(c, v, requestText, from) { }

  virtual void service();

otected:
  void whoAmI();
  void jumpingWhere(const char *from);
  void sendAd(const char *from);
  void activity(const char *activityStr);      // Netscape 2.0 frames
  void sendFrame(const char *from);
  void takeJump(const char *from);
  void sysState();

  void send(Database& db, Ad *ad, User *u);

  // send info
  void sendInfo(const char *url);
  void si_(const char *url);
;

 endif
```

EXHIBIT B

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```
// rememberad.h
//

void rememberSend(Ad *ad, User *u, const char *fromDoc);

// returns Ad ID
DWORD queryAdSent(User *u, const char *fromDoc);
```

SERVER.H

```
// server.h
//
// General ad server startup stuff.
//

BOOL startServer();
```

STATUS.H 02-Jan-1996 14:24

```
// status.h

void setStatus(const char *s);

extern int adsSent;
extern int jumpsTaken;
extern int totalAdSendLatency;
extern int totalAdSendTime;
extern int timeOuts;
extern int poolTimeOuts;

extern int barter, lanDev, testAd;

void latencyWas(int n);
void adSendTimeWas(int n);

void adSent();
```

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```
// request.h
//

#if !defined(_REQUEST_H_)
#define _REQUEST_H_

#include "/d/toolkit/sock.h"

enum Verb { UNKNOWN, GET, HEAD, POST };

class Connection;

class Request
{
public:
   Request(Connection *c, Verb v,
           const char *requestText,
           const sockaddr_in& from);

    virtual void service();

    DWORD getIP() const { return userIP; }
    const char* getRequest() const { return request; }
    Connection* getConn() const { return c; }

    void sendInternalError();

 protected:
    BOOL sendFile(const char *fileName, const char *insertStr = 0);

    Connection *c;
    const char *request;
    Verb v;
    CString fileName;
    DWORD userIP;
 };

 void sendError(Connection *c, const char *msg, const char *headerField = 0);

 #endif
```

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```
// header.cpp
//

#include "stdafx.h"
#include "objects.h"
#include "/d/toolkit/iaf_util.h"

const char cBrowser[] = "User-Agent:";

void message(const char *);

BOOL User::check(CString& userAgent, const char *pat, Browser b, OS o)
{
   if( browser != brUnknown )
      return FALSE;

   int l = strlen(pat);
   if( userAgent.Left(l) == pat ) {
      browser = b;
      os = o;
      const char *p = userAgent;
      p += l;
      p = strchr(p, '/');
      if( p ) {
         liftVer(p + 1);
      }
      return TRUE;
   }

   return FALSE;
}

static void match(OS& os, const char *userAgent, const char *pat, OS o)
{
   if( strstr(userAgent, pat) != 0 )
      os = o;
}

void User::liftOS(const CString& userAgent)
{
   if( userAgent.Find("X11") >= 0 ) {
      os = osUnixOther;
      match(os, userAgent, "SunOS", osUnixSun);
      match(os, userAgent, "HP-UX", osUnixHP);
      match(os, userAgent, "Linux", osUnixLinux);
      match(os, userAgent, "OSF", osUnixOSF1);
      match(os, userAgent, "AIX", osUnixAIX);
      match(os, userAgent, "IRIX", osUnixIRIX);
   }
   else if( userAgent.Find("Windows") >= 0 ) {
      if( userAgent.Find("32bit") >= 0 ||
         userAgent.Find("95") >= 0
        )
      {
         os = osWin32;
      } else {
         os = osWin16;
      }
   }
   else if( userAgent.Find("Win95") >= 0 ) {
      os = osWin95;
   }
   else if( userAgent.Find("Win16") >= 0 ) {
      os = osWin16;
   }
   else if( userAgent.Find("Macintosh") >= 0 ) {
      os = osMac;
      match(os, userAgent, "PPC", osMacPPC);
      match(os, userAgent, "68K", osMac68);
   }
   else if( userAgent.Find("WinNT") >= 0 ) {
      os = osWinNT;
   }
   else {
```

```
         s += userAgent.Left(70);
         message(s);
      }
}

// derive information about the user from the request header
//
void User::headerDerive(const char *requestHeader)
{
   const char *ua = strstr(requestHeader, cBrowser);
   if( ua == 0 ) {
      // if no user agent field, something weird we
      //  don't know much about, don't assume unique.
      uniqueness = uUnlikely;
   }
   else {
      ua += 11;
      while( *ua == ' ' )
         ua++;
      const char *p = strchr(ua, '\r');
      if( p ) {
         CString userAgent(ua, p - ua);
         if( userAgent.Left(8) == "Mozilla/" ) {
            browser = brNetscape;
            liftVer((const char *) userAgent + 8);

            // OS
            liftOS(userAgent);
         }
         else if( userAgent.Left(12) == "NCSA Mosaic/" ) {
            browser = brNCSA;
            liftVer((const char *) userAgent + 12);

            // OS
            match(os, userAgent, "Windows", osWin);
            match(os, userAgent, "X11", osUnixUnknown);
            match(os, userAgent, "X Window", osUnixUnknown);
         }
         else if( strncmp(userAgent, "IWENG/", 6) == 0 ) {
            browser = brAOL;
            uniqueness = uNo;
            domainType = dtAOL;
            liftVer((const char *) userAgent + 6);
            os = osWin;
         }
         else if( strncmp(userAgent, "aolbrowser/", 10) == 0 ) {
            browser = brAOL;
            uniqueness = uNo;
            domainType = dtAOL;
            liftVer((const char *) userAgent + 11);
            os = osMac;
         }
         else if( userAgent.Left(28) == "Microsoft Internet Explorer/" ) {
            // Microsoft Internet Explorer/4.40
            browser = brMicrosoft;
            liftVer((const char *) userAgent + 28);
            os = osWin32;
            match(os, userAgent, "Windows 95", osWin95);
         }
         else if( userAgent.Left(8) == "HotJava/" ) {
            browser = brHotJava;
            liftVer((const char *) userAgent + 8);
         }
         else if( userAgent.Left(16) == "Enhanced_Mosaic/" ) {
            browser = brEnhancedMosaic;
            liftVer((const char *) userAgent + 16);
            os = osWin;
            if( userAgent.Find("Win32") >= 0 )
               os = osWin32;
         }
         else if( userAgent.Left(11) == "NetCruiser/" ) {
            liftVer((const char *) userAgent + 11);
            browser = brNetCruiser;
            os = osWin;
         }
```

```
        else {
            check(userAgent, "OmniWeb", brOmniWeb, osNEXT);
            check(userAgent, "Lynx", brLynx, osUnknown);
            check(userAgent, "IBM WebExplorer", brWebExplorer, osOS2);
            check(userAgent, "AIR_Mosaic", brAirMosaic, osWin);
            check(userAgent, "SPRY_Mosaic", brAirMosaic, osWin);
            check(userAgent, "MacWeb", brMacWeb, osMac);
            check(userAgent, "NetManage", brChameleon, osWin);
            check(userAgent, "Netsurfer", brNetsurfer, osNEXT);
            check(userAgent, "CNNworks", brCNN, osWin);
            check(userAgent, "InterNotes", brNotes, osUnknown);
            check(userAgent, "Emissary", brEmissary, osUnknown);
            check(userAgent, "PipeMacWeb", brPipeMacWeb, osMac);
            check(userAgent, "internetMCI", brMCI, osUnknown);
            check(userAgent, "Quarterdeck", brQuarterdeck, osUnknown);
            check(userAgent, "NCSA Mosaic for the X ", brNCSA, osUnixUnknown);
            if( check(userAgent, "eworldbrowser", brEWorld, osMac) ) {
                if( userAgent.Find("68K") >= 0 )
                    os = osMac68;
                else if( userAgent.Find("PPC") >= 0 )
                    os = osMacPPC;
                uniqueness = uNo;
                domainType = dtEWorld;
            }
            else if( check(userAgent, "PRODIGY", brProdigy, osUnknown) ) {
                uniqueness = uNo;
                domainType = dtProdigy;
            }
            else if( check(userAgent, "Delphi", brDelphi, osUnknown) ) {
                uniqueness = uNo;
                domainType = dtDelphi;
            }
            else if( browser == brUnknown ) {
                TRACE("unknown useragent: %s\n", (const char *) userAgent);
                liftOS(userAgent);
            }
        }

        if( userAgent.Find("via proxy") >= 0 ) {
            proxy = TRUE;
            if( uniqueness == uUnknown )
                uniqueness = uNo;
        }
    }
  }
}
```

LOCATION.CPP 23-Dec-1995 11:01

```
// location.cpp

#include "stdafx.h"
#include "objects.h"
#include "/d/toolkit/mapstate.h"
#include "/d/toolkit/tzutil.h"

// next line should be in tzutil.h
extern CountryTimeZoneMap mapCountryTimeZones;

struct IsDaylightSavings
{
   IsDaylightSavings()
   {
      TIME_ZONE_INFORMATION i;
      DWORD r = GetTimeZoneInformation(&i);
      daylightSavings = r == TIME_ZONE_ID_DAYLIGHT;
   }

   BOOL daylightSavings;
} ids;

tm* Location::userRelativeTime( time_t timeRelative )
{
   int utc_offset;
   int daylight_bias;

   if( country == 256 ) {
      if( !getStateTimeZoneInfo(state, utc_offset, daylight_bias) )
         return FALSE;
   }
   else if( country == 0 ) {
      return FALSE;
   }
   else {
      DWORD dwBias;
      if( !mapCountryTimeZones.Lookup(country, dwBias) )
         return FALSE;

      utc_offset = LOWORD(dwBias);
      daylight_bias = HIWORD(dwBias);
   }

   time_t ttTime;

   //
   // if timeRelative == 0, this assumes that they want the time
   // relative to the current time
   ttTime = timeRelative;
   if (!ttTime)
   {
      time(&ttTime);
   }

   if( ids.daylightSavings && daylight_bias != TZ_BIAS_UNDEFINED )
      ttTime += daylight_bias * 60 * 60;
   else
      ttTime += utc_offset * 60 * 60;

   return gmtime(&ttTime);
}
```

```
// getrequest.cpp
//

#include "stdafx.h"
#include <strstrea.h>
#include <fstream.h>
#include "/d/toolkit/sock.h"
#include "getrequest.h"
#include "remembered.h"
#include "/d/toolkit/iaf_util.h"
#include "log.h"
#include "status.h"
#include "/d/toolkit/crit.h"
#include "/d/toolkit/db.h"
#include "/d/toolkit/dbutil.h"
#include "/d/toolkit/dbpool.h"

extern CriticalSection fast;
//extern Database iafmain;

extern ofstream errLog;
extern int activity;

extern const char *browserNames();

const char *progName = "AdSvr";

void message(const char *);

void recalcSI();

DWORD startLatency, endLatency;

// This used to prevent multiple concurrent FTP
// requests right now because our FTPD implementation
// only does one at a time.
//
extern HANDLE ftpMutex;

void GetRequest::service()
{
   const char *p = strchr(request, ' ');
   if( p )
      fileName = CString(request, p - request);
   else
      fileName = request;

   if( fileName.Left(4) == "/ad/" )
      sendAd((const char *) fileName + 4);
   else if( fileName.Left(9) == "/adframe/" )
      sendFrame((const char *) fileName + 9);
   else if( fileName.Left(6) == "/jump/" )
      takeJump((const char *) fileName + 6);
   else if( fileName.Left(10) == "/activity/" )
      activity((const char *) fileName + 10);
   else if( fileName.Left(7) == "/whoami" ) {
      //Crit c(fast);
      whoAmI();
   }
   else if( fileName.Left(8) == "/viewad/" ) {
      CString szFileName;
      szFileName.Format( "c:/ian/ads/%s", (LPCTSTR)fileName+8);
      sendFile( szFileName );
   }
   else if( fileName.Left(11) == "/stats.htm?" ) {
      sendError(c, "404 Not Found: Results forecast moved to another server");
      //stats((const char *) fileName + 11);
   }
   else if( fileName.Left(10) == "/sendinfo/" ) {
      sendinfo((const char *) fileName + 10);
      return;
   }
   else if( fileName.Left(4) == "/si_" ) {
      // send info stuff
      si_((const char *) fileName + 4);
```

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```
   }
   else if( fileName.Left(9) == "/sysstate" ) {
      sysState();
   }
   else {
      const char *p = fileName;
      if( strnicmp(p, "/java/", 6) == 0 ) {
         if( strstr(p, "..") == 0 )
            sendFile(p);
         else
            sendError(c, "404 Not Found");
      }
      else {
         if( *p == '/' )
            p++;
         if( *p == 0 ) {
            // send default
            sendFile("c:\\ian\\html\\default.htm");
            return;
         } else {
            if( //strchr(p, '/') == 0 && strchr(p, '\\') == 0 &&
               strstr(p, "..") == 0 )
            {
               CString f = "c:\\ian\\html\\";
               f += p;
               sendFile(f);
               return;
            }
         }
         sendError(c, "404 Not Found");
      }
   }

   // Normally we adjust SI for an ad as it is delivered.
   // However, occasionally should do all ads in case one hasn't
   // been delivered but time has passed.
   static int counter;
   if( ++counter > 200 ) {     // adjust constant as traffic increases
      counter = 0;
      Crit c(fast);
      if( allFree() ) {
         recalcSI();     // recalc SI for all ads
      }
      else {
         counter = 175;     // try again soon
      }
   }
}

const char cHeader[] =
   "HTTP/1.0 200 OK\r\nContent-Type: image/gif\r\nContent-Length: ";

// send() should commit the DB if it does any DB operations because
// the caller commits ahead of time so that the transaction won't
// remain open while the file is sent.
//
void GetPequest::send(Database& db, Ad *ad, User *u)
{
   CString hdr = cHeader;

   const BUFSIZE = 32000;
   char buf[BUFSIZE];

   Cookie sendCookie;
   if( &db != 0 ) {
      if( !u->hasCookie ) {
         if( u->cookieCapable() && !u->timedOut )
         {
            // If a user record already exists, it's probably because
            // this IP address is shared with other users (proxy, IP pool,
            // etc.)  So, we want to create another record; we don't want
            // to assign the same cookie to different people!
            u->userID = 0; // create new record

            // generate a cookie for the user
            u->hasCookie = TRUE;
            u->makePermanent(db);
            sendCookie.value = u->getID();
        }
    }

    // release DB here so that we don't keep a db connection occupied
    // while sending the ad
    db.commit();
    releaseToPool(&db);
  }

  CFile f;
  int n = 0;
  if( v == GET ) {
     CString s = ad->fullName();
     if( !f.Open(s, CFile::modeRead | CFile::shareDenyWrite) ) {
        message( CString("couldn't open ") + s );
        TRACE("couldn't open %s\n", (const char *) s);
        ASSERT(FALSE);
        return;
     }

     n = f.Read(buf, BUFSIZE);
     ASSERT( n != 0 && n != BUFSIZE );
  }
  else {
     n = getFileSize( ad->fullName() );
     // next line is a test for NCSA Mosaic HEAD
     //n = 1;
  }

  char temp[100];
  itoa(n, temp, 10);   // content length
  hdr += temp;
  if( !sendCookie.isNull() ) {
     wsprintf(temp,
           "\r\nSet-Cookie: IAP=%lx; path=/; expires=Wed, 09-Nov-99 23:59:00 GMT",
           sendCookie.value);
     hdr += temp;
  }

  // last-modified time
  hdr += "\r\nLast-Modified: " + curHTTPTime();

  //test
// hdr += "\r\nPragma: no-cache";

  hdr += "\r\n\r\n";

  endLatency = GetTickCount();

  c->write( (const char *) hdr, hdr.GetLength() );
  if( v == GET )
     c->write(buf, n);
}

// diagnostic
void GetRequest::eyeState()
{
   static char *typeStrs[] = {
      "Normal",
      "Test",
      "Barter",
      "Ian Dev" };


   CString hdr =
      "HTTP/1.0 200 OK\r\nContent-Type: text/html\r\nContent-Length: ";
   char buf[32000];
   *buf = 0;
   strstream text(buf, 32000, ios::out);

   // fill content
   text << "<html><body bgcolor=#ffffff>\r\n";
```

```
   text << "<h3>System State</h3><p>";
   text << "<table border=1 cellpadding=3>";
   text << "<tr><td><b>Name</b></td><td><b>Type</b></td><td><b>SI</b></td>";
   text << "<td><b>Ads Sent</b></td><td><b>Ads Booked</b></td></tr>\n";

   // Get a db connection to lock the ads array so that
   // it isn't reloaded or anything while we are processing.
   Database *db = getFromPool();

   for( int i = 0; i < ads.GetSize(); i++ ) {
      Ad *ad = ads.GetAt(i);
      text << "<tr><td><a href=\"http://ad.iantargets.com/viewad/";
      ad->fileName.MakeLower();
      text << ad->fileName << "\">" << ad->fileName << "</td>";
      text << "<td>" << typeStrs[ad->type] << "</td>";
      text << "<td>" << ad->si << "</td>";
      text << "<td>" << ad->nShown << "</td>";
      text << "<td>" << ad->maxImpressions << "</td></tr>\n";
   }

   releaseToPool(db);

   text << "</table>";
   text << "</body></html>";

   int n = text.pcount();
   char temp[100];
   itoa(n, temp, 10);   // content length
   hdr += temp;
   hdr += "\r\n\r\n";

   c->write( (const char *) hdr, hdr.GetLength() );
   c->write(buf, n);
}

// diagnostic
void GetRequest::whoAmI()
{
   Database &db = *getFromPool();

   User *user = User::lookupUser(db, userIP, request);
   user->lookupAncillaryInfo(db);

   CString hdr =
      "HTTP/1.0 200 OK\r\nContent-Type: text/html\r\nContent-Length: ";
   char buf[32000];
   *buf = 0;
   strstream text(buf, 32000, ios::out);

   // fill content
   text << "<html><body bgcolor=#ffffff><h1><IMG SRC=\"ianlogos.gif\" ALIGN=\"BOTTOM\">User In
   text << "<pre>";
   user->describe(db, text);
   text << "</pre></body></html>";

   int n = text.pcount();
   char temp[100];
   itoa(n, temp, 10);   // content length
   hdr += temp;
   hdr += "\r\n\r\n";

   c->write( (const char *) hdr, hdr.GetLength() );
   c->write(buf, n);

   delete user;
   releaseToPool(&db);
}

// diagnostic
void GetRequest::jumpingWhere(const char *from)
{
   ASSERT(FALSE);
   // fix for multi-db conns
/*
   User *user = User::lookupUser(userIP, request, FALSE);
   Ad *ad = Ad::findSentTo(user, from);

   if( ad == 0 ) {        // fix!
      delete user;
      return;
   }

   SitePage *page = SitePage::lookupPage(from, request);

   CString hdr =
      "HTTP/1.0 200 OK\r\nContent-Type: text/html\r\nPragma: no-cache\r\nContent-Length: ";
   char buf[32000];
   *buf = 0;
   strstream text(buf, 32000, ios::out);

   // fill content
   text << "<html><body><h1>Jump Redirect</h1>";
   text << "<pre>";
   text << "jumping from document: " << from << "\r\n";
   text << "           would jump to: "
   text << "
      << "<a href=\"" << (const char *) ad->jumpTo << "\">"
      << (const char *) ad->jumpTo << "</a>\r\n\r\n";
      << (const char *) ad->fullName() << "\r\n\r\n";
                                 ad: " << (const char *) ad->fullName() << "\r\n\r\n";
   text << "

   CString fn = ad->fileName;
   text << "<center><img src=\"/"
      << (const char *) fn
      << "\">";
   text << "</pre></body></html>";

   int n = text.pcount();
   char temp[100];
   itoa(n, temp, 10);    // content length
   hdr += temp;
   hdr += "\r\n\r\n";

   c->write( (const char *) hdr, hdr.GetLength() );
   c->write(buf, n);

   logJump(ad, user, page);

   delete page;
   delete ad;
   delete user;
*/
}

void GetRequest::sendFrame(const char *from)
{
   CString s = "HTTP/1.0 200 OK\r\nContent-Type: text/html\r\n";
   s += "\r\n<HTML><BODY><CENTER><a href=\"http://206.4.219.5/jump/";
   s += from;
   s += "\">\n<img src=\"http://206.4.219.5/ad/";
   s += from;
   s += "\">\n</a></center></html>";    //  Width=468 Height=60
   c->write( (const char *) s, s.GetLength() );
}

void GetRequest::activity(const char *activityStr)
{
   // go ahead and send for best response time
   sendFile("c:\\ian\\html\\dot.gif");

   BOOL bad = FALSE;

   // send the file first
   ActivityType type;
   CString siteKey;
   BOOL ok = TRUE;
   switch( *activityStr )
   {
      case 'a':
         type = Interest;
         break;
      case 'i':
```

```
         type = InfoRequest;
         break;
      case 's':
         type = Sale;
         break;
      default:
         ok = FALSE;
   }

   if( ok ) {
      const char *p = activityStr + 1;
      if( *p != '/' )
         ok = FALSE;
      else {
         p++;
         const char *q = strchr(p, '/');
         if( q == 0 )
            ok = FALSE;
         else
            siteKey = CString(p, q - p);
      } .
   }

   if( ok ) {
      Database *db = getFromPool();
      User *user = User::lookupUser(*db, userIP, request);
      DWORD advertiserID = 0;
      // todo: fix if not assigned a user ID. (use IP)?
      if( user->userID != 0 ) // if not from IAN, skip logging
      {
         Cursor c(*db);
         c.bind(SQL_C_LONG, &advertiserID, sizeof(advertiserID));
         char sql[1024] = "select id from advertisers where sitekey=";
         addValue(sql, siteKey, FALSE);
         c.exec(sql);
         ok = c.fetchNext();
      }

      db->commit();

      if( ok ) {
         ::activity++;
         if( advertiserID != 0 )
            logActivity(user, advertiserID, type);
      }

      delete user;
      releaseToPool(db);
   }

   if( !ok ) {
      message( CString("invalidate activity str: ") +
               CString(activityStr).Left(80) );
//    sendError(c, "404 Not Found");
   }
}

void GetRequest::sendAd(const char *from)
{
   if( from && strnicmp(from, "www.", 4) == 0 )
      from += 4;

   Database *db = getFromPoolTimeout();

   static DWORD lastFTP;
   startLatency = GetTickCount();

   User *user;
   SitePage *page;
   Ad *ad;

   user = User::lookupUser(*db, userIP, request, TRUE, TRUE);
   if( db == 0 ) {
      page = 0;
   }
   else {
      page = SitePage::lookupPage(*db, from, request);
   }
   ad = Ad::getAd(*db, user, page, v == GET);

// if( v == GET) {
//    TRACE("get %s\n", from);
// }

   static int randCutoff = 0; //RAND_MAX / 4;

   BOOL doFTP = !user->tempUserObject() &&
      !user->ftpTried && user->uniqueness >= uLikely && !user->proxy &&
      rand() < randCutoff && (startLatency - lastFTP > 6000);
   DWORD dw;
   if( doFTP )
      dw = WaitForSingleObject(ftpMutex, 0);
   if( doFTP && dw != WAIT_FAILED && dw != WAIT_TIMEOUT ) {

      lastFTP = startLatency;

      // Remember that we're doing FTP for user.  Only do once.
      user->ftpTried = TRUE;
      user->updateFTPTried(*db);

      // Redirect
      CString s = "Location: ";
      s += "ftp://206.4.219.6/";
      char buf[10];
      wsprintf(buf, "%lx", user->getID());
      s += buf;
      s += '/';
      CString fn = ad->getFileName();
      s += (const char *) fn;

      errLog << "Trying FTP\n";
      errLog << "  user " << user->getID() << '\n';
      errLog << "  browser " << browserNames[(int) user->browser] << '\n';
      errLog << "  url " << s << '\n';

      s += "\r\n";
      sendError(c, "302 Moved Temporarily", s);

      VERIFY( ReleaseMutex(ftpMutex) );

      logAdSend(ad, user, page);

      errLog.flush();

      db->commit();
      releaseToPool(db);
   }
   else
   {
      //f.cs.leave();
      send(*db, ad, user);    // this function calls releaseToPool()
      //f.cs.enter();
      if( v == GET ) {
         static int counter;
         if( ++counter & 2 )
            ad->calcSI();      // update SI every 4 or so deliveries

         rememberSend(ad, user, from);
         logAdSend(ad, user, page);
         if( user->timedOut ) {
            if( db == 0 )
               poolTimeOuts++;
            else
               timeOuts++;
         }

         // state
         c->close();     // flush send
         DWORD endSend = GetTickCount();
         la      'as(endLatency - startLatency);
```

```
            adSendTimeWas(endSend - startLatency);
         }
      }

// delete ad;
   delete page;
   delete user;
}

void GetRequest::takeJump(const char *_from)
{
   Database &db = *getFromPool();

// jumpingWhere(from);
// return;

   User *user = User::lookupUser(db, userIP, request, FALSE);

   if( _from && strnicmp(_from, "www.", 4) == 0 )
      _from += 4;

   CString from;
   {
      const char *p = strchr(_from, '?');
      if( p == 0 ) {
         from = _from;
         char buf[512];
         wsprintf(buf, "no ismap %d: %s", user == 0 ? 999 : (int) user->browser, (const char *)
         message(buf);
      }
      else
         from = CString(_from, p - _from);
   }

   Ad *ad = Ad::findSentTo(user, from);
   SitePage *page = SitePage::lookupPage(db, from, request);

   ///f.cs.leave();
   CString s = "Location: ";
   s += ad->jumpTo;// + "?from=is&";
   s += "\r\n";
   sendError(c, "301 Moved Permanently", s);
   c->close();
   //f.cs.enter();

   // Must do this so activity will be logged properly.
   // See GetRequest::activity().
   user->makePermanent(db);

   logJump(ad, user, page);

   delete page;
   delete ad;
   delete user;
   db.commit();
   releaseToPool(&db);
}
```

```
// objects.cpp

#include "stdafx.h"

//-------------------------------------------------------------------------

const char *uniqueNames[] = {
   "Unknown", "No", "Unlikely", "Likely", "Yes"
};

const char *browserNames[] = {
    "Unknown",
    "Netscape",
    "NCSA Mosaic",
    "AOL Browser",
    "HotJava",
    "Microsoft",
    "OmniWeb",
    "Lynx",
    "NetCruiser",
    "IBM WebExplorer",
    "AIR Mosaic/Spry Mosaic",
    "MacWeb",
    "NetManage Chameleon",
    "Netsurfer",
    "Enhanced Mosaic",
    "eworld Browser",
    "Prodigy Browser",
    "Delphi Browser",
    "CNN Browser",
    "InterNotes",
    "Wollagong/ATM Emissary",
    "PipeMacWeb",
    "internetMCI",
    "Quarterdeck Mosaic"
};

const char *osNames[] = {
    "Unknown",
    "Win16",
    "Win32",
    "Windows",
    "Win95",
    "WinNT",
    "OS/2",
    "Macintosh",
    "Mac 68k",
    "Mac PowerPC",
    "Unix (brand unknown)",
    "Unix (other)",
    "Unix (Sun)",
    "Unix (Linux)",
    "Unix (HP)",
    "Unix (AIX)",
    "Unix (OSF)",
    "Unix (IRIX)",
    "NEXT",
    "Unix (SGI)"
};

const char *domainTypeNames[] = {
    "Unknown",
    "Commercial", "Education", "Government",
    "Military", "K-12", "Foreign", "Networks",
    "Organizations",

    0,

    "AOL",
    "Prodigy",
    "Compuserve",
    "Delphi",
    "eworld",
    "MSN",
    "DowJones",
```

```
    "Genie",

    0,0,0,0,0,0,0,
    "Reserved for ISP Names"
};

const char *ISPNames[] = {
    "ISP",
    "NetCom",
    "PSI",
    "UUNet",
    "Advantis",
    "Concentric Research Corp.",
    "CRL",
    "MCI",
    "Portal Information Network"
};

const char *salesStr[] = {
    "unknown",
    "$1 - $49,999",
    "$50,000 - $99,999",
    "$100,000 - $249,999",
    "$250,000 - $499,999",
    "$500,000 - $999,999",
    "$1 million - $4,999,999",
    "$5 million - $9,999,999",
    "$10 million - $49,999,999",
    "$50 million - $499,999,999",
    "$500 million - $999,999,999",
    "$1 billion and over"
};

const char *empStr[] = {
    "unknown",
    "1 - 4",
    "5 - 9",
    "10 - 14",
    "15 - 19",
    "20 - 49",
    "50 - 99",
    "100 - 499",
    "500 - 999",
    "1,000 and over",
};

const char *genderStr[] = {
    "unknown",
    "Male",
    "Female"
};

const char *timesStr[] = {
    "12am-1am",
    "1am-2am",
    "2am-3am",
    "3am-4am",
    "4am-5am",
    "5am-6am",
    "6am-7am",
    "7am-8am",
    "8am-9am",
    "9am-10am",
    "10am-11am",
    "11am-12pm",
    "12pm-1pm",
    "1pm-2pm",
    "2pm-3pm",
    "3pm-4pm",
    "4pm-5pm",
    "5pm-6pm",
    "6pm-7pm",
    "7pm-8pm",
    "8pm-9pm",
    "9pm-10pm",
   "10pm-11pm",
   "11pm-12am"
};

const char *dowStr[] = {
   "Sunday",
   "Monday",
   "Tuesday",
   "Wednesday",
   "Thursday",
   "Friday",
   "Saturday"
};


#if !defined(_JUSTSTRINGS)


#include <strstrea.h>
#include <fstream.h>
#include "winsock.h"
#include "objects.h"
#include "tables.h"
#include "/d/toolkit/iaf_util.h"
#include "/d/toolkit/db.h"
#include "/d/toolkit/dbutil.h"
#include "/d/derive/sqlderive.h"
#include "/d/newderive/sig.h"
#include "rememberad.h"

extern ofstream errLog;

extern Ad *badKeyErrorAd;

int nextAd = 0;

#if !defined(_DERIVE)
int nAds();
#endif
extern Ad *defaultAd;

//------------------------------------------------------------------------
// User

BOOL User::cookieCapable() const
{
   // todo: add new version of Internet Explorer

   return browser == brNetscape &&
      (bVer2 >= 1 ||
      bVer1 > 1);
}

void User::deriveDomainTypeFromBrowser()
{
   switch( browser ) {
      case brAOL:
         domainType = dtAOL;
         break;
      case brEWorld:
         domainType = dtEWorld;
         break;
      case brProdigy:
         domainType = dtProdigy;
         break;
      case brDelphi:
         domainType = dtDelphi;
         break;
      default:
         ;
   };
}

DWORD User::getID() const
{
```

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```
   return userID;
}

User::User()
{
   timedOut = FALSE;
   userID = 0;
   uniqueness = uUnknown;
   ip = 0;
   browser = brUnknown;
   bVer1 = bVer2 = 0;
   os = osUnknown;
   domainType = dtUnknown;
// for( int i = 0; i < MAXSICS; i++ )
//    sicCodes[i] = 0;
   nEmployees = 0;
   salesVolume = 0;
   proxy = FALSE;
   isNetworkDescription = FALSE;
   ftpTried = FALSE;
   hasCookie = FALSE;
}

void User::describe(Database& db, strstream& text)
{
   in_addr ipAddr = (in_addr&) ip;
   text << "<b>ip:            </b>"
      << (int) ipAddr.S_un.S_un_b.s_b1 << '.'
      << (int) ipAddr.S_un.S_un_b.s_b2 << '.'
      << (int) ipAddr.S_un.S_un_b.s_b3 << '.'
      << (int) ipAddr.S_un.S_un_b.s_b4 << "\r\n";

   gender = ' ';
   if( !emailAddr.IsEmpty() ) {
      // get name/gender
      Cursor c(db);
      CString g,f,l;
      c.bind(g);
      c.bind(f);
      c.bind(l);
      Signature s;
      s.email = emailAddr;
      s.l.pullEmail();
      if( !s.l.domain.IsEmpty() ) {
         char sql[1024] = "select gender,fname,lname from listings where emailname=";
         addValue(sql, s.l.emailname, FALSE);
         strcat(sql, " and domain=");
         addValue(sql, s.l.domain, FALSE);

         c.exec(sql);
         if( c.fetchNext() ) {
            if( g.GetLength() )
               gender = g.GetAt(0);
            name = f + ' ' + l;
            cap(name);
         }
      }
      db.commit();
   }

   text << "<b>unique:        </b>" << uniqueNames[uniqueness] << "\r\n";
   text << "<b>cookie:        </b>" << (hasCookie ? "Yes" : "No") << "\r\n";
   text << "<b>browser:       </b>" << browserNames[browser] << "\r\n";
   text << "<b>browser ver:   </b>" << (int) bVer1 << '.' << (int) bVer2 << "\r\n";
   text << "<b>os:            </b>" << osNames[os] << "\r\n";
   text << "<b>domain type:   </b>" << domainTypeNames[domainType] << "\r\n";
   text << "<b>proxy:         </b>" << (proxy ? "Yes" : "No") << "\r\n";
   text << "<hr>";
   text << "<b>name:          </b>" << name << "\r\n";
   text << "<b>title:         </b>" << title << "\r\n";
   text << "<b>state:         </b>" << location.state << "\r\n";
   text << "<b>zip code:      </b>" << location.zipCode << "\r\n";
   text << "<b>area code:     </b>" << location.areaCode << "\r\n";
   text << "<b>phone:         </b>" << phone << "\r\n";
   text << "<b>e-mail:        </b>" << emailAddr << "\r\n";
   text << "<b>location:     </b>";
   if( location.country == 256 ) {
      text << "USA";
   } else {
      text << "country #" << location.country;
   }
   text << "\r\n";

   text << "<b>job function:</b>" << "\r\n";
   text << "<b>gender:        </b>";
   if( gender == 'm' || gender == 'n' )
      text << "Male";
   else if( gender == 'f' || gender == 'g' )
      text << "Female";
   else
      text << '?';
   text << "\r\n";
   text << "<hr>";

   Domain *d = Domain::lookupDomain(ip);
   if( d == 0 ) {
      text << "<i>No company information available.</i>";
   }
   else {                                                               //domainName
      text << "<b>domain name: </b>" << (const char *) d->domain << "\r\n";
      text << "<b>bus. name:   </b>" << (const char *) d->name <<"\r\n";
      text << "<b>address:     </b>" << (const char *) d->address[0] << "\r\n";
      for( int i = 1; i < NADDR; i++ ) {
         if( !d->address[i].isEmpty() ) {
            text << "               " << (const char *) d->address[i] << "\r\n";
         }
      }

      text << "<b>contact:     </b>" << (const char *) d->contact[0] << "\r\n";
      for( i = 1; i < NCONTACT; i++ ) {
         if( !d->contact[i].isEmpty() ) {
            text << "               " << (const char *) d->contact[i] << "\r\n";
         }
      }

      text << "<b>industries:  </b>\r\n";
      {
         sicCodes.reset();
         SICCode sc;
         while( sicCodes.getNext(sc) ) {
            text << "               " << sc.asTextFullyPadded() << "\r\n";
         }
      }

//    for( i = 0; i < MAXSICS; i++ )
//       if( d->sicCodes[i] )
//          text << d->sicCodes[i] << ' ';

      text << "\r\n<b>no. empl.:    </b>";
      if( nEmployees )
         text << nEmployees;
      else
         text << "less than 25 (unknown)";
      text << "\r\n";
      text << "<b>revenue:      </b>";
      if( salesVolume )
         text << salesVolume;
      else
         text << "less than $1MM (unknown)";
      delete d;
   }

   text << "<hr>";
   text << "<b>You are interested in the following:</b>\r\n\r\n";
   text << "Interest Level  Category  Description\r\n";
   text << "--------------  --------  ---------------------------------------\r\n";
   {
      DWORD level;
      CString category;
```

```
      CString desc;
      Cursor c(db);
      c.bind(SQL_C_LONG, &level, 4);
      c.bind(category);
      c.bind(desc);
      char sql[512];
      wsprintf(sql,
"select interest_level,category,name from interests,user_interests\
 where interests.id=interest_id and user_id=%ld\
 order by interest_level DESC", userID);
      c.exec(sql);
      while( c.fetchNext() ) {
         char buf[32];
         wsprintf(buf, "%14ld  ", level);
         text << buf;
         text << category << "  " << desc << "\r\n";
      }
      db.commit();
   }
}

void User::_getNetworkInfo(Database& db, BOOL *timedOut)
{
   if( ip == 0 ) {
      ASSERT(FALSE);
      return;
   }

// if( domainType != dtUnknown ) {
//    // got dt from header info
//    // if ISP/OSP, location and sales, etc. don't apply.
//    // if we have done a tracert, location does apply.
//    // (or ISPs/OSPs.
//    if( domainType != dtNetcom )  // did tracert for netcom
//       return;
// }

   // Note: do the following for all domain types to at least get country.

   NetworkNumber n;
   n = justNetworkNumber(ip);

   char buf[256] =
      "select domain_type,sales,num_employees,sic,country,state,zipcode,areacode from networks+
   Cursor c(db);
   if( domainType < dtAOL ) {
      c.bind(SQL_C_LONG, &domainType, sizeof(domainType));
      c.bind(SQL_C_LONG, &salesVolume, sizeof(salesVolume)); salesVolume = 0;
      c.bind(SQL_C_LONG, &nEmployees, sizeof(nEmployees)); nEmployees = 0;
      sicCodes.bind(c);
   } else {
      strcpy(buf, "select country,state,zipcode,areacode from networks where netnumber=");
   }
   strcat( buf, n.sqlStr() );

   c.bind(SQL_C_LONG, &location.country, sizeof(location.country));
   c.bind(location.state);
   c.bind(location.zipCode);
   c.bind(SQL_C_LONG, &location.areaCode, sizeof(location.areaCode));
   if( timedOut != 0 )
      c.setTimeOut(1);
   c.exec(buf);
   if( c.timedOut() )
      *timedOut = TRUE;
   else
      c.fetchNext();

   if( uniqueness == uUnknown && (int) domainType >= (int) dtAOL )
      uniqueness = uUnlikely;

   if( domainType >= dtAOL ) {
      salesVolume = 0;
      nEmployees = 0;
      sicCodes.makeNull();
      if( domainType != dtNetcom && domainType != dtISPOther ) {
            // don't know location, except country
            location.state.Empty();
            location.zipCode.Empty();
            location.areaCode = 0;
        }
    }
    else {
        sicCodes.checkNull();
    }
}.

#if !defined(_DERIVE)

const char cCookie[] = "Cookie:";

void User::liftVer(const char *verStr)
{
    int v1 = 0, v2 = 0;
    sscanf(verStr,
        "%d.%d", &v1, &v2);
    bVer1 = v1;
    bVer2 = v2;
}

/*
User* User::_lookupUserByID(DWORD userID)
{
    User *u = new User;
    return u;
}

User* User::_lookupUserByAddress(DWORD ip)
{
    DWORD userID = networkNodeTable.getUserID(ip, FALSE);
    if( userID == 0 ) {
        // Try to get domain info at least.  Note: if user is uniquely
        // identifiable, derive data process will create a record for the
        // user as soon as it gets a chance.
        userID = networkNodeTable.getUserID(justNetworkNumber(ip), TRUE);
    }
    if( userID ) {
        return _lookupUserByID(userID);
    }
    return 0;
}
*/

extern defaultAdsMode;

User* User::lookupUser(Database& db, DWORD ip, const char *requestHdr, BOOL loadDemographics, *

{
    BOOL _timedOut = &db == 0;
    BOOL *tmout = realTime ? &_timedOut : 0;

    //-----------------------------------------------------------
    // get cookie for lookup

    Cookie cookie;

    const char *ck = strstr(requestHdr, cCookie);
    if( ck )
        cookie.getFromHeader(ck, "IAF");

    //-----------------------------------------------------------
    // lookup

    User *u = 0;

    if( !cookie.isNull() ) {
        if( _timedOut ) {
            u = new User;
            u->uniqueness = uYes;
            u->ip = ip;
            u->userID = cookie.value;
            u->timedOut = TRUE;
```

```
        }
        else {
            // lookup by cookie
            u = _lookupUserByID(db, cookie.value, tmout);
            if( u ) {
                u->uniqueness = uYes;
                u->ip = ip;
            }
            else {
                if( defaultAdsMode ) {
                    // db conn down
                    u = new User;
                    u->uniqueness = uYes;
                    u->ip = ip;
                    u->userID = cookie.value;
                } else {
                    // Couldn't find user record, we will need to
                    // assign a new cookie.  Do not load by IP, because
                    // we don't want this user sharing a record
                    // with others without cookies.
                    //
                    // Note: generally, this shouldn't happen.
                    cookie.value = 0;
                }
            }
        }
    }
    else if( !_timedOut ) {
        u = _lookupUserByAddress(db, ip, tmout);
        if( u ) {
            u->ip = ip;
            u->hasCookie = FALSE;
        }
    }

    if( u == 0 ) {
        // make a default user object
        u = new User;
        //u->uniqueness = uNo;
        u->ip = ip;
        u->timedOut = _timedOut;
    }

    u->headerDerive(requestHdr);

    if( !cookie.isNull() )
        u->hasCookie = TRUE;

    if( loadDemographics && !_timedOut )
        u->_getNetworkInfo(db, realTime ? &u->timedOut : 0);

    return u;
}

//-------------------------------------------------------------------------
// SitePage

Ad* Ad::findSentTo(User *user, const char *fromDoc)
{
    DWORD adNum = queryAdSent(user, fromDoc);

    for( int i = 0; i < nAds(); i++ ) {
        Ad& ad = *ads.GetAt(i);
        if( ad.id == adNum )
            return new Ad(ad);
    }

    if( badKeyErrorAd && adNum == badKeyErrorAd->id )
        return badKeyErrorAd;

    if( user->uniqueness >= uLikely ) {
#if defined(errLog)
        errLog << "findSentTo failed uniqueness-likely\n";
        errLog << "  user: " << user->userID << '\n';
        errLog << "  from doc: " << fromDoc << '\n';
        errLog.flush();
#endif
    }

    // temp: just return first ad (ISS)
    //return new Ad( ads.ElementAt(0) );

    return new Ad( *defaultAd );
// return 0;
}

#endif

#endif
```

```
// cookie.cpp
//

#include "stdafx.h"
#include "objects.h"

//------------------------------------------------------------------------------
// Cookie

const Cookie& Cookie::operator=(const char *s)
{
   sscanf(s, "%lx", &value);
   return *this;
}

/*static*/
Cookie Cookie::alloc(DWORD userID)
{
   ASSERT( userID != 0 );
   Cookie k;
   k.value = userID;
   return k;
}

// Get value for a particular cookie name from the HTTP header
//   hdr - points to the Cookie: field in the header
//
void Cookie::getFromHeader(const char *hdr, const char *name)
{
   hdr += 7;    // skip "Cookie:"

   const char *p = strchr(hdr, '\r');
   if( p ) {
      CString nm = name;
      nm += '=';
      const char *q = strstr(hdr, nm);
      if( q && q < p )
         *this = q + nm.GetLength();
   }
}
```

```
// match.cpp
//
// Ad Matching!
//

#include "stdafx.h"
#include "objects.h"
#include "/d/toolkit/db.h"
#include "/d/toolkit/dbutil.h"

extern Ad *defaultAd;
extern Ad *badKeyErrorAd;

extern int nextAd;

int nAds();

// Returns TRUE if this location is in region.
//
BOOL Location::in(const Region& region)
{
   if( region.country != 0 && country != region.country )
      return FALSE;

   if( region.areaCode != 0 && areaCode != region.areaCode )
      return FALSE;

   if( !region.state.IsEmpty() && stricmp(state, region.state) != 0 )
      return FALSE;

   if( region.zipCode.IsEmpty() )
      return TRUE;

   // zip
   CString myZip = zipCode.Left(5); // strip zip+4 for now
   CString regZip = region.zipCode.Left(5);
   CString regZipEnd = region.zipEnd.Left(5);

   if( regZipEnd.IsEmpty() )
      return regZip == myZip;

   return myZip >= regZip && myZip <= regZipEnd;
}

BOOL Ad::exposuresOK(Database& db, User *user)
{
   seriesNext = 0;

   if( frequency == 0 || &db == 0 )
      return TRUE;

   int n;
   BOOL found;
   {
      if( user->getID() == 0 ) {
         TRACE("userid=0?\n");
         return FALSE;
      }

      Cursor c(db);
      c.bind( SQL_C_LONG, &n, sizeof(n) );
      char sql[512] = "select exposures from exposures where ad_id=";
      addValue(sql, id, FALSE);
      strcat(sql, " and user_id=");
      addValue(sql, user->getID(), FALSE);
      c.exec(sql);
      found = c.fetchNext();
   }
   if( found ) {
      if( n >= frequency )
         return FALSE;

      seriesNext = n + 1;

      char sql[1024] =
```

```
         "update exposures set exposures=exposures+1 where ad_id=";
      addValue(sql, id, FALSE);
      strcat(sql, " and user_id=");
      addValue(sql, user->getID(), FALSE);
      db.exec(sql);

      return TRUE;
   }

   char sql[1024] =
      "insert exposures values(";
   addValue(sql, id);
   addValue(sql, user->getID(), FALSE);
   strcat(sql, ",1)");
   db.exec(sql);

   return TRUE;
}

// Note: any matching required for nontargeted ads can be placed here,
//       since this function is called for both targeting and untargeted
//       ads.
//
BOOL Ad::spreadOK(SitePage *sitepage)
{
   // Is start time met?
   if( !started ) {
      time_t now;
      if( time(&now) < startTime )
         return FALSE;
      started = TRUE;
   }

   // impressions OK?
   if( nShown >= maxImpressions && maxImpressions != 0 )
      return FALSE;

   if( isSpreadEvenly() && si >= 1120 )
      return FALSE;

   if( !targetSites.IsEmpty() ) {
      if( sitepage == 0 )
         return FALSE;
      BOOL v;
      BOOL found = targetSites.Lookup(sitepage->siteID, v);
      if( includeSites ) {
         // If we have pages to target too, ok if site
         // doesn't match (check if page does next).
         if( !found && targetPages.IsEmpty() )
            return FALSE;
      } else if( found )
         return FALSE;
   }

   return TRUE;
}

// Does user and site match this ad's criteria?
BOOL Ad::matches(User *user, SitePage *sitepage)
{
   if( !targetPages.IsEmpty() ) {
      if( sitepage == 0 )
         return FALSE;
      BOOL v;
      BOOL found = targetPages.Lookup(sitepage->id, v);
      if( includePages ) {
         if( !found )
            return FALSE;
      }
      else if( found )
         return FALSE;      // excluding this page
   }

   // Operating system
   DWORD o = 1 << ((int) user->os);
   if( (o & os) == 0 )
      return FALSE;

   // Browser
   o = 1 << ((int) user->browser);
   if( (o & browser) == 0 )
      return FALSE;

   // DomainType
   int userISP = 0;
   int dt = (int) user->domainType;
   if( dt >= (int) dtISPOther ) {
      userISP = dt - (int) dtISPOther + 1;
      dt = 0;

      // ISP
      o = 1 << userISP;
      if( (o & isp) == 0 )
         return FALSE;
   }
   else {
      o = 1 << dt;
      if( (o & domainType) == 0 )
         return FALSE;
   }

   // location
   if( locations != 0 ) {      // if ISP, don't know location (yet)
      if( userISP )
         return FALSE;

      BOOL ok = FALSE;
      for( int i = 0; i < nLocations; i++ ) {
         if( user->location.in( locations[i] ) ) {
            ok = TRUE;
            break;
         }
      }
      if( !ok )
         return FALSE;
   }

   // hour of day / day of week
   if( hoursOfDay != 0xffffff || daysOfWeek != 0x7f ) {
      tm *t;
      if( isAbsoluteTime() ) {
         // EST time relative
         time_t now;
         time(&now);
         t = localtime(&now);
      }
      else {
         t = user->location.userRelativeTime();
         if( t == 0 )
            return FALSE;
      }
      if( (hoursOfDay & (1 << t->tm_hour)) == 0 )
         return FALSE;
      if( (daysOfWeek & (1 << t->tm_wday)) == 0 )
         return FALSE;
   }

   // sales
   if( salesVolume != 0x7fffffff ) {
      o = 1 << user->salesVolume;
      if( (o & salesVolume) == 0 )
         return FALSE;
   }

   // # employees
   if( nEmployees != 0x7fffffff ) {
      o = 1 << user->nEmployees;
      if( (o & nEmployees) == 0 )
         return FALSE;
   }
```

```
   // SIC
   if( nSICCodes ) {
      BOOL ok = FALSE;
      int i = 0;
      while( 1 ) {
         if( i >= nSICCodes ) {
            // no match
            return FALSE;
         }
         SICCode& pattern = sicCodes[i];
         user->sicCodes.reset();
         SICCode sc;
         while( user->sicCodes.getNext(sc) ) {
            if( pattern.matches(sc) ) {
               ok = TRUE;
               break;
            }
         }
         if( ok )
            break;
         i++;
      }
   }

   // Site and page categories
   // Do last, because this is expensive (disk hit)
   if( !siteCategories.IsEmpty() ) {
      BOOL v;
      if( sitepage == 0 )
         return FALSE;
      sitepage->loadCategories();
      for( int i = 0; i < sitepage->categories.GetSize(); i++ )
         if( siteCategories.Lookup(sitepage->categories.GetAt(i), v) )
            return TPUE;
      return FALSE;
   }

   return TRUE;
}

inline BOOL Ad::criteriaOK(Databases& db, User *user, SitePage *page)
{
   return spreadOK(page) &&
      (!isTargeted() ||
       (matches(user, page) && exposuresOK(db, user))
      );
}

// todo: if reload ads, need to handle the fact that
//       one may still be in use and can't just delete.
//       (Crit sect released during sending of file.)
//
Ad* Ad::getAd(Databases& db, User *user, SitePage *page, BOOL increment)
{
   const SIMAX = 1000000;

   if( user->uniqueness < uLikely )
      return defaultAd;

   if( page == 0  ) {
      if( badKeyErrorAd )
         return badKeyErrorAd;
      ASSEPT(FALSE);
   }

   if( increment )
      nextAd = (nextAd + 1) % nAds();

   int lowestSI;
   Ad *adLowestSI;

   const int start = nextAd;

   // Do a test ad, if appropriate.  Always do these first so that
   // a truly random distribution is used for them rather than
   // leftovers.
   static int testCounter;
   if( ++testCounter % 4 == 0 ) {      // just try every 4 to save CPU
      // test ad avail?
      lowestSI = 1051;
      int i = start;
      while( 1 ) {
         Ad& ad = *ads.GetAt(i);
         if( ad.type == Test && ad.si < lowestSI && ad.criteriaOK(db, user, page) )
         {
            lowestSI = ad.si;
            adLowestSI = &ad;
         }
         i = (i + 1) % nAds();
         if( i == start )
            break;
      }
      if( lowestSI <= 1050 )
         return adLowestSI;
   }

   lowestSI = SIMAX;
   adLowestSI = defaultAd;

   // Check remnants first.  This way, we don't
   // have to do ad matching for any targeted ads
   // with high SI's.
   //
   int i = start;
   while( 1 ) {
      Ad& ad = *ads.GetAt(i);
      if( ad.type == Normal && !ad.isTargeted() && ad.si < lowestSI && ad.spreadOK(page) )
      {
         lowestSI = ad.si;
         adLowestSI = &ad;
      }

      i = (i + 1) % nAds();
      if( i == start )
         break;
   }

   // this is temp; eventuel all placements will have book rates
   // you'll want to remove this to get better performance (no ad matching
   // if remnant has worst SI).
   static int counter;
   if( ++counter & 1 ) {
      // for ads with no booking amount,
      // allow a targeted ad to run sometimes
      if( lowestSI == 1100 )
         lowestSI++;
   }

      // for ads where we don't care about # impressions,
      // bias in favor of targeted
//    if( lowestSI == 1100 )
//       lowestSI++;

   // todo later: if ads are sorted by si (lowest first),
   //          you can quit matching as soon as you find
   //        | one.  Could be a good optimization.

   // do targeted
   i = start;
   while( 1 ) {
      Ad& ad = *ads.GetAt(i);
      if( ad.type == Normal && ad.isTargeted() &&
         ad.si < lowestSI &&
         ad.spreadOK(page) &&
         ad.matches(user, page) &&
         ad.exposuresOK(db, user) ) .
      {
         // found a good one
         lowestSI = ad.si;
```

```
         adLowestSI = &ad;
      }

      i = (i + 1) % nAds();
      if( i == start )
         break;
   }

   if( lowestSI > 1400 ) {
      // do either a barter ad or an fan dev ad
      static int counter;
      if( ++counter % 5 == 0 ) {
         // do an fan dev ad
         i = start;
         while( 1 ) {
            Ad& ad = *ads.GetAt(i);
            if( ad.type == fanDev && ad.criteriaOK(db, user, page) ) {
               // found a good one
               adLowestSI = &ad;
               break;
            }
            i = (i + 1) % nAds();
            if( i == start )
               break;
         }
      }
      else {
         // do barter
         lowestSI = SIMAX;
         i = start;
         while( 1 ) {
            Ad& ad = *ads.GetAt(i);
            if( ad.type == Barter &&
               ad.si < lowestSI &&
               ad.criteriaOK(db, user, page) ) {
               // found a good one
               adLowestSI = &ad;
               lowestSI = ad.si;
            }
            i = (i + 1) % nAds();
            if( i == start )
               break;
         }
      }
   }

   return adLowestSI;
}
```

```
// request.cpp
//

#include "stdafx.h"
#include "/d/toolkit/sock.h"
#include "request.h"
#include "/d/toolkit/iaf_util.h"

#if defined(_CONSOLE)
#include <fstream.h>
#endif

#if defined(_IAF)
extern ofstream *outLog;
void impression();
#endif

extern CString gratuitous;

Request::Request(
   Connection *_c,
   Verb _v,
   const char *_request,
   const sockaddr_in& from) :
      c(_c), request(_request), v(_v)
{
   userIP = from.sin_addr.s_addr;
}

int spider = 0;

BOOL Request::sendFile(const char *fileName, const char *insertStr)
{
#if defined(_IAF)
   *outLog << "-end " << fileName << ' ' << inet_ntoa( (in_addr&) userIP ) << '\n';
#endif

   const char insertChar = '~';
   BOOL isSpider = FALSE;

   CString hdr = "HTTP/1.0 200 OK\r\nContent-Type: ";
   if( strstr(fileName, ".class") != 0 ) {
      hdr += "application/java\r\nContent-Length: ";
   }
   else if( strstr(fileName, ".gif") != 0 ) {
      hdr += "image/gif\r\nContent-Length: ";
   } else {
      hdr += "text/html\r\nContent-Length: ";
#if defined(_IAF)
      impression();
#endif
      int gnt = 0;
      if( strstr(request, "-Agent:  Lycos") != 0 )
         gnt = 1;
       if( strstr(request, "InfoSeek Robot") != 0 )
         gnt = 2;
      if( strstr(request, "-Agent: WebCrawl") != 0 )
         gnt = 3;

      if( gnt )
      {
         isSpider = TRUE;
         spider++;
         #if defined(_CONSOLE)
         cout << "********** Robot " << gnt << " *********\n";
         #endif
      }
   }

   const BUFSIZE = 138000;
   char buf[BUFSIZE + 260];
   CFile f;
   CFileException fe;
```

```
   if( v == GET || v == POST ) {
      if( !f.Open(fileName, CFile::modeRead | CFile::shareDenyWrite, &fe) ) {
         if( fe.m_cause == CFileException::accessDenied )
            sendError(c, "404 Not Found (Access Denied)");
         else if( fe.m_cause == CFileException::sharingViolation )
            sendError(c, "404 Not Found (Sharing Violation)");
         else
            sendError(c, "404 Not Found");
         return FALSE;
      }
      n = f.Read(buf, BUFSIZE);
   }
   else {
      isSpider = FALSE;

      // HEAD
      n = getFileSize(fileName);
      if( n == 0 ) {
         sendError(c, "404 Not Found");
         return FALSE;
      }
   }
   ASSERT( n != 0 && n != BUFSIZE );

   char *p = buf;
   if( insertStr ) {
      while( 1 ) {
         p = strchr(p, insertChar);
         if( p == 0 )
            break;
         int l = strlen(insertStr);
         memmove(p + l, p + 1, strlen(p+1));
         memcpy(p, insertStr, l);
         p += l;
         n += l;
      }
   }

   if( isSpider ) {
      if( gratuitous.IsEmpty() ) {
      #if defined(_CONSOLE)
         cout << "gratuitous empty. (?)\n";
      #endif
      }
      else {
         buf[n] = 0;
         char *p = strstr(buf, "</BODY");
         if( p ) {
            for( int i = 0; i < 20; i++ ) {
               strcpy(p, gratuitous);
               p += gratuitous.GetLength();
            }
            strcpy(p, "</BODY></HTML>");
            n = (p - buf) + 14;
         }
         else {
         #if defined(_CONSOLE)
               cout << "/body?\n";
         #endif
         }
      }
   }

   char temp[100];
   itoa(n, temp, 10);    // content length
   hdr += temp;
   hdr += "\r\n\r\n";

   c->write( (const char *) hdr, hdr.GetLength() );
   if( v == GET || v == POST )
      c->write(buf, n);

   return TRUE;
}
```

```
void Request::service()
{
   const char *p = strchr(request, ' ');
   if( p )
      fileName = CString(request, p - request);
   else
      fileName = request;

   {
      const char *p = fileName;
      if( *p == '/' )
         p++;
      if( *p == 0 ) {
         // send default
         //sendFile("k:\\my documents\\internet address finder\\iafmain.htm");
#if defined(_IAF)
         sendFile("c:\\iaf\\html\\iafmain.htm");
         return;
#endif
      } else {
         if( strchr(p, '\\') == 0 && strstr(p, "..") == 0 ) {
            if( strchr(p, '/') != 0 ) {
               CString f = "c:\\ian\\";
               f += p;
               sendFile(f);
               return;
            }
            else
            {
   #if defined(_IAF)
               CString f = "c:\\iaf\\html\\";
   #elif defined(_MANAGE)
               CString f = "c:\\ian\\manage\\";
   #else
               ASSERT(FALSE);
               CString f = "jakldf";
               //CString f = "k:\\my documents\\ad federation\\";
   #endif
               f += p;
               sendFile(f);
               return;
            }
         }
      }
      sendError(c, "404 Not Found");
   }
}

void Request::sendInternalError()
{
   sendError(c, "500 Internal Server Error");
}
```

```
// rememberad.cpp
//

#include "stdafx.h"
#include "objects.h"
#include "rememberad.h"
#include "/d/toolkit/hashwf.h"
#include "/d/toolkit/crit.h"

const SZ = 10733;

// this is a test
static int cr;
#define INCRIT { ASSERT(cr==0); cr++; }
#define OUTCRIT { ASSERT(cr==1); cr--; }

void message(const char *);

extern CriticalSection fast;

struct Key
{
   DWORD userID;
   DWORD fromHash;

   BOOL operator==(const Key& k) const
   {
      return userID == k.userID && fromHash == k.fromHash;
   }

   void setID(User *u)
   {
      if( u->userID )
         userID = u->userID;
      else
         userID = u->ip;
   }

   void setFrom(const char *from)
   {
      fromHash = hashwf(from);
   }
};

UINT HashKey(Key key)
{
   return key.userID ^ key.fromHash;
   // default identity hash - works for most primitive values
// return ((UINT)(void*)(DWORD)key) >> 4;
}

struct Value
{
   DWORD adSent;
   DWORD time;
};

class Memory
{
public:
   Memory() : sent(100)
   {
      sent.InitHashTable(SZ);
   }

   void remember(Key& k, DWORD adID);
   DWORD lookup(Key& k);

private:
   void purge();

   CMap<Key, Key&, Value, Value&> sent;
} memory;

// todo: fix
```

```
// todo: nonunique hashes
//
//DWORD hash(const char *from, User *u)
//{
// char buf[10];
// wsprintf( buf, "%x", u->getID() );
// CString s = buf;
// s += from;
// return hashwf(s);
//}

void Memory::remember(Key& k, DWORD adID)
{
   static int count;
   if( ++count > 1000 ) {
      count = 0;
      purge();
   }

   Value v;
   v.adSent = adID;
   v.time = ::GetTickCount();
   sent.SetAt(k, v);
}

DWORD Memory::lookup(Key& k)
{
   Value value;
   if( sent.Lookup(k, value) ) {
      return value.adSent;
   }
   return 0;
}

void Memory::purge()
{
   const LIMIT = 1000 * 60 * 60 * 24;     // too much?

   if( sent.GetCount() > SZ ) {
      message("remember map > SZ");
   }

   DWORD now = ::GetTickCount();
   POSITION p = sent.GetStartPosition();
   while( p ) {
      Key k;
      Value v;
      sent.GetNextAssoc(p, k, v);
      if( now - v.time > LIMIT )
         sent.RemoveKey(k);
   }
}

void rememberSend(Ad *ad, User *u, const char *fromDoc)
{
   Crit c(fast);
// INCRIT
   Key k;
   k.setID(u);
   k.setFrom(fromDoc);
   memory.remember(k, ad->id);
// OUTCRIT
}

DWORD queryAdSent(User *u, const char *fromDoc)
{
   Crit c(fast);
// INCRIT
   Key k;
   k.setID(u);
   k.setFrom(fromDoc);
   DWORD d = memory.lookup(k);
// OUTCRIT
   return d;
}
```

```
// sqldb.cpp
//

#include "stdafx.h"
#include <fstream.h>
#include "objects.h"
#include "/d/toolkit/db.h"
#include "/d/toolkit/iaf_util.h"
#include "/d/toolkit/dbutil.h"
#include "/d/toolkit/dbpool.h"
#include "/d/toolkit/crit.h"

// this ad displayed if a bad sitekey is encountered
const cBadKeyAdID = 49;

extern CriticalSection fast;

Database iafmain;
void message(const char *);

BOOL defaultAdsMode = FALSE;

static int uctOfs;
static void localToUCT(time_t& t)
{
    t += uctOfs;
}

// This is temporary.  Used for non-unique users.
// Eventually will be smarter about what to send to
// these users.
Ad *defaultAd = 0;

Ad *badKeyErrorAd = 0;

typedef CArray<Ad *, Ad *> AdArray;

BOOL loadAds(AdArray& ads,
          DWORD advertiserID,    // 0=all
          BOOL forTargeting,     // if forTargeting, update Ad::targetSites to reflect
                            //   site exclusions
          BOOL activeOnly,     // active=1 only
          BOOL includeExpired,   // include where enddate has past or where all delivered
          BOOL newestFirst,      // order from newest to oldest
          DWOPD siteID = 0);

BOOL openSQLDB()
{
   iafmain.open();
   openDBPool();

// if( !iafmain.open() )
//    return FALSE;
//
// if( !openDBPool() )
//    return FALSE;

// if( !iafmain.Open(0, FALSE, FALSE,
//                 "ODBC;DSN=iaf;UID=sa;PWD=",
//                 /*FALSE*/ TRUE) )
//
//    return FALSE;

   if( !loadAds(ads, 0, TRUE, TRUE, FALSE, FALSE) )
      return FALSE;

   return TRUE;
}

void reloadAds()
{
   BOOL ok = FALSE;
   message("waiting to reload ads...");
   AfxGetApp()->m_pMainWnd->Invalidate();
   AfxGetApp()->m_pMainWnd->UpdateWindow();
   while( 1 ) {
```

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```
      {
         Crit c(fast);
         if( allFree() ) {
            for( int i = 0; i < ads.GetSize(); i++ ) {
               delete ads.GetAt(i);
               ads.RemoveAll();
               defaultAd = 0;
               ok = loadAds(ads, 0, TPUE, TRUE, FALSE, FALSE);
            }
            break;
         }
      }
      Sleep(50);
   }
   if( ok )
      message("Ad reload completed OK");
   else
      message("Ad reload failure!");
}

// note: this isn't getting called yet
void closeSQLDB()
{
   iafmain.close();
}

//------------------------------------------------------------------------
// Ads

AdArray ads;

class AdCursor : public Cursor
{
public:
   AdCursor()
   {
      bind(SQL_C_LONG, &ad.id, 4);
      bind(SQL_C_LONG, &ad.type, sizeof(ad.type));
      bind(SQL_C_LONG, &ad.os, sizeof(ad.os));
      bind(SQL_C_LONG, &ad.browser, sizeof(ad.browser));
      bind(SQL_C_LONG, &ad.domainType, sizeof(ad.domainType));
      bind(SQL_C_LONG, &ad.isp, sizeof(ad.isp));
      bind(ad.fileName);
      bind(ad.jumpTo);
      bind(SQL_C_LONG, &ad.frequency, sizeof(ad.frequency));
      bind(SQL_C_LONG, &ad.imageSeries, sizeof(ad.imageSeries));
      bind(SQL_C_LONG, &ad.maxImpressions, sizeof(ad.maxImpressions));
      bind(SQL_C_LONG, &ad.nShown, sizeof(ad.nShown));
      bind(SQL_C_LONG, &ad.startTime, sizeof(ad.nShown));
      bind(SQL_C_LONG, &ad.endTime, sizeof(ad.nShown));
      bind(SQL_C_LONG, &ad.flags, sizeof(ad.flags));
      bind(SQL_C_LONG, &ad.hoursOfDay, sizeof(ad.hoursOfDay));
      bind(SQL_C_LONG, &ad.daysOfWeek, sizeof(ad.daysOfWeek));
      bind(SQL_C_LONG, &ad.nEmployees, sizeof(ad.nEmployees));
      bind(SQL_C_LONG, &ad.salesVolume, sizeof(ad.salesVolume));
      bind(SQL_C_LONG, &ad.active, sizeof(ad.active));
      bind(ad.adDescription);
      bind(SQL_C_LONG, &ad.maxAmount, sizeof(ad.maxAmount));
      bind(ad.szPONumber);
      bind(SQL_C_LONG, &ad.approved, sizeof(ad.approved));
      bind(SQL_C_LONG, &ad.nJumps, sizeof(ad.nJumps));
   }

   Ad ad;
};

// ... TODO!!! This function is not thread-safe.
void recalcSI()
{
   for( int i = 0; i < ads.GetSize(); i++ ) {
      Ad& ad = *ads.GetAt(i);
      ad.calcSI();
   }
}
```

```
static void makeDefaultAds(AdArray& ads)
{
   ifstream defAds("c:\\ian\\default_ads.txt");
   if( !defAds.is_open() ) {
      ASSERT(FALSE);
      return;
   }

   message("db connection failed, using default_ads.txt");
   defaultAdsMode = TRUE;

   while( 1 ) {
      char fn[128];
      char jumpTo[128];
      *fn = 0;
      defAds >> fn >> jumpTo;
      if( *fn == 0 )
         break;

      Ad& ad = *(new Ad);
      defaultAd = &ad;
      time_t now;
      ad.startTime = time(&now) - 60 * 60 * 24 * 15;
      ad.endTime = now + 60 * 60 * 24 * 15;
      ad.fileName = fn;
      ad.jumpTo = jumpTo;
      ads.Add(&ad);
   }
}

BOOL loadAds(AdArray& ads,
         DWORD advertiserID,     // 0=all
         BOOL forTargeting,      // if forTargeting, update Ad::targetSites to reflect
                         //    site exclusions
         BOOL activeOnly,      // active=1 only
         BOOL includeExpired,    // include where enddate has past or where all delivered
                         //    (for management and reporting...)
         BOOL newestFirst,       // order from newest to oldest
         DWORD approveSiteID)    // exclude ads the specified site has approved
{
   {
      // calc time zone adjustment
      CTime t = CTime::GetCurrentTime();
      tm gmt, local;
      t.GetGmtTm(&gmt);
      t.GetLocalTm(&local);
      if( local.tm_hour > gmt.tm_hour )
         gmt.tm_hour += 24;
      uctOfs = (gmt.tm_hour - local.tm_hour) * 60 * 60;
   }

   ads.SetSize(0, 64);

   DWORD active = 1;
   getConfigValue("Active", active);
   AdCursor rs;
   char sql[2000] =
      "select id,type,os,browser,domainType,isp,filename,jumpto,frequency,image_series,\
start_time),datediff(ss, '1/1/70', end_time),\
max_impressions,n_shown,datediff(ss, '1/1/70', start_time),datediff(ss, '1/1/70', end_time),\
max_impressions,n_shown,days_of_week,employees,sales,active,description,max_amount,po_number,\
flags,hours_of_day,days_of_week,employees,sales,active,description,max_amount,po_number,\
approved,n_Jumps from placements";

   BOOL where = FALSE;

   if( !includeExpired ) {
      strcat( sql, " where (max_impressions=0 or n_shown<max_impressions) and \
(end_time=null or end_time>=getdate())");
      where = TRUE;
   }

   if (activeOnly)
   {
      if( where ) {
         strcat(sql, " and");
      } else
```

```
         where = TRUE;
         strcat(sql, " where");
      }
      strcat( sql, " active=" );
      addValue(sql, active, FALSE);
   }

   if( advertiserID ) {
      if( where ) {
         strcat(sql, " and");
      } else {
         where = TRUE;
         strcat(sql, " where");
      }
      strcat(sql, " advertiser=");
      addValue(sql, advertiserID, FALSE);
   }

   if( approveSiteID ) {
      if( where ) {
         strcat(sql, " and");
      } else {
         where = TRUE;
         strcat(sql, " where");
      }

      strcat(sql, " not exists (select * from approved where site_id=");
      addValue(sql, approveSiteID, FALSE);
      strcat(sql, " and ad_id=id)");
   }

   if( newestFirst ) {
      strcat(sql, " order by id desc");
   }

   rs.exec(sql);

   while( 1 ) {
      // defaults in case null
      rs.ad.flags = 0;

      if( !rs.fetchNext() )
         break;

      // if for debug, don't load.  You can make this test a registry
      // setting if you like so that you can load debug records, or
      // add a cmd line setting.
      if( !rs.ad.isProduction() )
         continue;

//       if( rs.isNull(12) ) {
//          time_t now;
//          rs.ad.startTime = time(&now);
//          rs.ad.endTime = rs.ad.startTime + 60 * 60 * 24 * 30;
//       }
//       else {
//          localToUCT(rs.ad.startTime);
//          localToUCT(rs.ad.endTime);
//       }
      if( rs.isNull(12) ) {
         // ad server needs fake times for now...
         if( forTargeting ) {
            time_t now;
            rs.ad.startTime = time(&now) - 60 * 60 * 24 * 15;
            rs.ad.endTime = now + 60 * 60 * 24 * 15;
         }
         else {
            rs.ad.startTime = rs.ad.endTime = 0;
         }
      }
      else {
         localToUCT(rs.ad.startTime);
         localToUCT(rs.ad.endTime);
      }
      Ad *ad = new Ad(rs.ad);
      ad->calcSI();
      if( ad->id == cBadKeyAdID && forTargeting ) {
         delete badKeyErrorAd;
         badKeyErrorAd = ad;
      }
      else {
         ads.Add(ad);
         if( defaultAd == 0 && ad->type != Ad::Test && !ad->isTargeted() )
            defaultAd = ad;
      }
   }

   isfmain.commit();

   // load sites to include/exclude
   for( int i = 0; i < ads.GetSize(); i++ ) {
      Ad& ad = *ads.GetAt(i);
      if( !ad.isTargeted() )
         continue;
      DWORD siteID;
      BOOL include;
      Cursor c;
      c.bind( SQL_C_LONG, &siteID, sizeof(siteID) );
      c.bind( SQL_C_LONG, &include, sizeof(include) );
      char sql[512] = "select site_id,include from placement_sites where ad_id=";
      addValue(sql, ad.id, FALSE);
      c.exec(sql);
      int n = 0;
      while( c.fetchNext() ) {
         if( ad.targetSites.IsEmpty() ) {
            ad.targetSites.InitHashTable(37);
            ad.includeSites = include;
         }
         ad.targetSites.SetAt(siteID, TRUE);
         n++;
      }
      if( n > 31 ) {
         message("Increase Ad::targetSites hash size");
      }
   }

   if( forTargeting ) {
      // Load site exclusions of placements.  If exclude this ad,
      // and Ad::includeSites is TRUE, remove site from map.  If
      // exclude this ad, and Ad::includeSites is FALSE, add this
      // site to the map.
      for( int i = 0; i < ads.GetSize(); i++ ) {
         Ad& ad = *ads.GetAt(i);
         DWORD siteID;
         Cursor c;
         c.bind(SQL_C_LONG, &siteID, sizeof(siteID));
         char sql[512] = "select site_id from placement_banned where ad_id=";
         addValue(sql, ad.id, FALSE);
         c.exec(sql);
         while( c.fetchNext() ) {
            if( ad.targetSites.IsEmpty() ) {
               ad.targetSites.InitHashTable(37);
               ad.includeSites = FALSE;    // exclude
            }
            if( ad.includeSites ) {
               ad.targetSites.RemoveKey(siteID);
               if( ad.targetSites.GetCount() == 0 ) {
                  // since map is empty, will go to all sites,
                  //   which is wrong.  Deactivate.
                  ad.startTime = ad.endTime = 0;
                  message( CString("error, no sites allowed for ") + ad.fileName );
               }
            } else
               ad.targetSites.SetAt(siteID, TRUE);
         }
      }
   }
```

```
   // load pages to include/exclude
   for( i = 0; i < ads.GetSize(); i++ ) {
      Ad& ad = *ads.GetAt(i);
      if( !ad.isTargeted() )
         continue;
      DWORD pageID;
      BOOL include;
      Cursor c;
      c.bind( SQL_C_LONG, &pageID, sizeof(pageID) );
      c.bind( SQL_C_LONG, &include, sizeof(include) );
      char sql[512] = "select page_id,include from placement_pages where ad_id=";
      addValue(sql, ad.id, FALSE);
      c.exec(sql);
      int n = 0;
      while( c.fetchNext() ) {
         if( ad.targetPages.IsEmpty() ) {
            ad.targetPages.InitHashTable(37);
            ad.includePages = include;
         }
         ad.targetPages.SetAt(pageID, TRUE);
         n++;
      }
      if( n > 31 ) {
         message("Increase Ad::targetPages hash size");
      }
   }

   // load site/page categories
   for( i = 0; i < ads.GetSize(); i++ ) {
      Ad& ad = *ads.GetAt(i);
      if( !ad.isTargeted() )
         continue;
      DWORD interestID;
      Cursor c;
      c.bind( SQL_C_LONG, &interestID, sizeof(interestID) );
      char sql[512] = "select interest_id from placement_sitecats where ad_id=";
      addValue(sql, ad.id, FALSE);
      c.exec(sql);
      int n = 0;
      while( c.fetchNext() ) {
         if( ad.siteCategories.IsEmpty() ) {
            ad.siteCategories.InitHashTable(37);
         }
         ad.siteCategories.SetAt(interestID, TRUE);
         n++;
      }
      if( n > 31 ) {
         message("Increase Ad::siteCategories hash size");
      }
   }

   // load sics
   for( i = 0; i < ads.GetSize(); i++ ) {
      Ad& ad = *ads.GetAt(i);
      if( !ad.isTargeted() )
         continue;

      int n = 0;
      {
         Cursor c;
         c.bind(SQL_C_LONG, &n, sizeof(n));
         char sql[512] = "select count(*) from placement_sics where ad_id=";
         addValue(sql, ad.id, FALSE);
         c.exec(sql);
         if( !c.fetchNext() )
            continue;
         if( n == 0 )
            continue;
         if( n > 100 )
            message(">100 SICs targeted");
      }

      Cursor c;
      CString sic;
      c.bind(sic);
```

```
        char sql[512] = "select siccode from placement_sics where ad_id=";
        addValue(sql, ad.id, FALSE);
        c.exec(sql);
        SICCode *s = 0;
        while( c.fetchNext() ) {
           stripSpaces(sic);
           if( s == 0 ) {
              // to do: count the # of SICs first, and allocate that number
              //        rather than 50
              s = new SICCode[n];
              ad.sicCodes = s;
           }
           *s = sic;
           if( ++ad.nSICCodes == n ) {
              ASSERT( !c.fetchNext() );
              break;
           }
           s++;
        }
     }

     // load regional
     for( i = 0; i < ads.GetSize(); i++ ) {
        Region *l = 0;
        Ad &ad = *ads.GetAt(i);
        if( !ad.isTargeted() )
           continue;

        int n = 0;
        {
           Cursor c;
           c.bind(SQL_C_LONG, &n, sizeof(n));
           char sql[512] = "select count(*) from placement_locations where ad_id=";
           addValue(sql, ad.id, FALSE);
           c.exec(sql);
           if( !c.fetchNext() )
              continue;
           if( n == 0 )
              continue;
           if( n > 100 )
              message(">100 locations targeted");
        }

        Cursor c;
        WORD country;
        CString state, zip;
        int areaCode;
        c.bind(SQL_C_LONG, &country, sizeof(country));
        c.bind(state);
        c.bind(zip);
        c.bind(SQL_C_LONG, &areaCode, sizeof(areaCode));
        char sql[512] = "select country,state,zipcode,areacode from placement_locations where ad=
        addValue(sql, ad.id, FALSE);
        c.exec(sql);
        areaCode = 0;
        while( c.fetchNext() ) {
           if( l == 0 ) {
              l = new Region[n];
              ad.locations = l;
           }
           l->country = country;
           l->state = state;
           l->zipCode = zip;
           l->areaCode = areaCode;
           if( ++ad.nLocations == n ) {
              ASSERT( !c.fetchNext() );
              break;
           }
           l++;
           areaCode = 0;
        }
     }

     iafmain.commit();
```

```
     if( ads.GetSize() == 0 && forTargeting ) {
        // db connection down, use some default ads
        makeDefaultAds(ads);
     }

     if( defaultAd == 0 ) {
        TRACE("no default ad\n");
        message("no default ad");
     }

     return ads.GetSize() != 0 && defaultAd != 0;
  }
```

```
// server.cpp
//

#include "stdafx.h"
#include <fstream.h>
#include "server.h"
#include "/d/toolkit/sock.h"
#include "/d/toolkit/mapstate.h"
#include "/d/toolkit/tzutil.h"
#if defined(_ADSVR)
#include "getrequest.h"
#include "tables.h"
 oid message(const char *);
#elif defined(_IAP)
#include "request.h"
#include "iafrequest.h"
void qrPurge();
void message(const char *) { }
#else
#include "request.h"
#include "mgmtrequest.h"
void message(const char *) { }
#endif

#include "/d/toolkit/crit.h"
extern CriticalSection fast;

const char cHTTPVer[] = "HTTP/1.0 ";
const char cContentLen[] = "Content-Length: ";
const char cErrHeader[] = "<h1>Error ";
const char cErrTrailer[] = "</h1>";
const char cContentHTML[] = "Content-Type: text/html\r\n";

extern int nListenerThreads;

ofstream errLog;

void sendError(Connection *c, const char *msg, const char *headerField)
{
   char buf[10];

   CString s = cHTTPVer;
   s += msg;
   s += "\r\n";
   s += cContentHTML;
   if( headerField )
      s += headerField;
   s += cContentLen;
   int len = strlen(msg) + strlen(cErrHeader) + strlen(cErrTrailer);
   s += itoa(len, buf, 10);
   s += "\r\n\r\n";
   s += cErrHeader;
   s += msg;
   s += cErrTrailer;

   c->write( (const char *) s, s.GetLength() );
}

BOOL addressOK(const sockaddr_in& from)
{
   if( from.sin_addr.S_un.S_un_b.s_b1 == 206 &&
      from.sin_addr.S_un.S_un_b.s_b2 == 4 &&
      from.sin_addr.S_un.S_un_b.s_b3 == 219 )
   {
      // IAP network
      return TRUE;
   }

   return FALSE;
}

void serviceRequest(Connection *c, const sockaddr_in& from)
{
// if( !addressOK(from) )
//     return;
```

```
   const BUFLEN = 32768;
   char buf[BUFLEN];
   buf[1] = 0;
   int n = 0;                                      // total n bytes read
   const char *p = buf;
   int countDown = 0;                      // Content-length
   Connection::ReadError err = Connection::OK;
   while( 1 ) {
      int toRead = BUFLEN - n - 1;
      int nRead = c->read(buf + n, toRead, err);
      n += nRead;
      buf[n] = 0;
      if( countDown ) {
         countDown -= nRead;
         if( countDown <= 0 )
            break;
      }
      if( nRead == 0 ) {
         // error
         break;
      }
      const char *p;
      if( (p = strstr(buf, "\r\n\r\n")) != 0 ) {
         const char *cl = strstr(buf, "Content-length:");

         if( (!cl)
            cl = strstr(buf, cContentLen);

         if( cl ) {
            cl += 15;
            sscanf(cl, "%ld", &countDown);
            countDown -= strlen(p + 4);    // decrement by what we've already got
//          countDown -= n - ((p + 4) - buf); // decrement by what we've already got
            if( countDown > 0 )
               continue;
         }
         break;
      }
   }

   Verb v = UNKNOWN;
   const char *r = buf;
   if( strnicmp(buf, "get ", 4) == 0 ) {
      v = GET;
      r += 4;
   } else if( strnicmp(buf, "head ", 5) == 0 ) {
      v = HEAD;
      r += 5;
   } else if( strnicmp(buf, "post ", 5) == 0 ) {
      v = POST;
      r += 5;
   }

   if( v == UNKNOWN ) {
      if( *buf == 0 ) {
         sendError(c, "400 Bad Request");
         if( buf[1] != 0 ) {
            message("empty request, buf!");
         }
         else if( err == Connection::TimeOut ) {
            message("empty request, timeout");
         }
         else if( err == Connection::ReadErr ) {
            message("empty request, readerr");
         }
         else {
            message("empty request, err=OK?");
         }
      }
      else {
         sendError(c, "501 Not Implemented");
      }
      return;
   }
```

```
#if defined(_IAF)
   IAFRequest gr(c, v, r, from);
#elif defined(_ADSVR)
   GetRequest gr(c, v, r, from);
#else
   MgmtRequest gr(c, v, r, from);
#endif
   gr.service();
}

Listener *listener = 0;

static nThread = 0;
int maxThreads = 1;

UINT listenerThread(LPVOID)
{
   static DWORD sd = GetTickCount();
   srand( sd++ );

   while( 1 ) {
      sockaddr_in from;
      Connection *c = listener->waitForConnection(from);
      if( c ) {
         {
            Crit c(fast);
            int x = ++nThread;
            if( x > maxThreads )
               maxThreads = x;
         }
         serviceRequest(c, from);
         delete c;
         {
            Crit c(fast);
            nThread--;
#if defined(_IAF)
            if( nThread == 0 ) {
               // idle
               qrPurge();
            }
#endif
         }
      }
   }

   return 0;
}

BOOL startServer()
{
#if defined(_ADSVR)
   if( !openTables() ) {
      AfxMessageBox("Error opening tables");
      return FALSE;
   }

   if( !initWinsock() ) {
      return FALSE;
   }

   mapStateInit();
   initCountryTimeZoneTable();
#endif

#if 0
   {
      // TEMP!
      Connection c;
      if( c.connect("www.microsoft.com", 80) ) {
         c.write("GET /asdf HTTP/1.0\r\n\r\n", 22);

         while( 1 ) {
            char buf[256];
            int n = c.read(buf, 255);
```

```
            if( n ) {
               buf[n] = 0;
               TRACE("%s", buf);
            }
            else
               break;
         }
      }
      return TRUE;
   }
#endif

#if defined(_PORT)
   int   port = _PORT;
#else
   int   port = 80;
#endif
   listener = new Listener(port);
   if( listener->ok() ) {

#if defined(_ADSVR)
      errLog.open("c:/ian/errlog.txt",
                  ios::out | ios::app,
                  filebuf::sh_read);
      ASSERT( errLog.is_open() );
      errLog << "------ ad server started\n"; errLog.flush();
#endif

      for( int i = 0; i <nListenerThreads; i++ ) {
         Sleep(100); // (dam) this is a test; sometimes it doesn't listen right, just a hunch
         AfxBeginThread( listenerThread, 0 );
      }
   }
   else
      ASSERT(FALSE);

   return TRUE;
}
```

```
// users.cpp
//

#include "stdafx.h"
#include "objects.h"
#include "/d/toolkit/db.h"
#include "/d/toolkit/iaf_util.h"
#include "/d/toolkit/dbutil.h"

/* implementation for hash tables
User* User::_lookupUserByID(DWORD userID)
{
   User *u = new User;
   return u;
}

User* User::_lookupUserByAddress(DWORD ip)
{
   DWORD userID = networkNodeTable.getUserID(ip, FALSE);
   if( userID == 0 ) {
      // Try to get domain info at least.  Note: if user is uniquely
      // identifiable, derive data process will create a record for the
      // user as soon as it gets a chance.
      userID = networkNodeTable.getUserID(justNetworkNumber(ip), TRUE);
   }
   if( userID ) {
      return _lookupUserById(userID);
   }
   return 0;
}
*/

class UserCursor : public Cursor
{
public:
   UserCursor(Database& db, User *_u) : Cursor(db),
      u(_u) { }

   // just gets field that aren't derivable from request header
   void minimalBind()
   {
      bind( SQL_C_LONG, &u->ftpTried, sizeof(BOOL) );
      bind( SQL_C_LONG, &u->hasCookie, sizeof(BOOL) );
   }

   User  *u;
};

void User::lookupAncillaryInfo(Database& db)
{
   if( userID == 0 ) {
      return;
   }

   Cursor c(db);
   char sql[128];
   wsprintf(sql, "select email from users where id=%ld", userID);
   c.bind(emailAddr);
   c.exec(sql);
   c.fetchNext();
   db.commit();
}

User* User::_lookupUserByID(Database& db, DWORD userID, BOOL *timedOut)
{
   User *u = new User;
   UserCursor c(db, u);
   c.minimalBind();
   char sql[128];

   wsprintf(sql, "select ftp_tried,has_cookie from users where id=%ld", userID);
   if( timedOut != 0 )
      c.setTimeOut(1);
   c.exec(sql);
```

```
   if( c.timedOut() ) {
      *timedOut = TRUE;
      delete u; u = 0;
   }
   else if( c.fetchNext() ) {
      u->userID = userID;
   } else {
      delete u;
      u = 0;
   }

   return u;
}

User* User::_lookupUserByAddress(Database& db, DWORD ip, BOOL *timedOut)
{
   User *u = new User;
   UserCursor c(db, u);
   c.minimalBind();
   c.bind( SQL_C_LONG, &u->userID, 4 );
   char sql[128];
   wsprintf( sql, "select ftp_tried,has_cookie,id from users where ip=%s",
                  (const char *) sqlIPStr(ip) );
   if( timedOut != 0 )
      c.setTimeOut(1);
   c.exec(sql);

   if( c.timedOut() ) {
      *timedOut = TRUE;
      delete u;
      u = 0;
   }
   else if( !c.fetchNext() ) {
      delete u;
      u = 0;
   }

   return u;
}

void User::updateFTPTried(Database& db)
{
   if( tempUserObject() ) {
      ASSERT(FALSE);
      return;
   }

   char buf[256];
   wsprintf(buf, "update users set ftp_tried=%d where id=%ld",
                 ftpTried ? 1 : 0, userID
                 );
   db.exec(buf);
   db.commit();
}

void User::makePermanent(Database& db)
{
   if( !tempUserObject() )
      return;

   ASSERT( name.isEmpty() && title.isEmpty() && emailAddr.isEmpty() );

   // add to DB
   char buf[4096] =
      "insert users (ip,browser,bver1,bver2,os,domain_type,is_proxy,is_networkdesc,ftp_tried,h
   strcat(buf, " values (");
   addDInValue(buf, ip);
   addValue(buf, browser);
   addValue(buf, bVer1);
   addValue(buf, bVer2);
   addValue(buf, os);
   addValue(buf, domainType);
   addBool(buf, proxy);
   addBool(buf, isNetworkDescription);
   addBool(buf, ftpTried);
```

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```
    addBool(buf, hasCookie, FALSE);
    strcat(buf, ")");

    if( db.doInsert(buf) == 1 ) {
        Cursor c(db);
        c.bind(SQL_C_LONG, &userID, 4);

        strcpy(buf, "select max(id) from users where ip=");
        addBinValue(buf, ip, FALSE);
        c.exec(buf);

        c.fetchNext();

        ASSERT( userID != 0 );
    }

    db.commit();
}
```

```
// sitepage.cpp
//

#include "stdafx.h"
#include "objects.h"
#include "/d/toolkit/db.h"
#include "/d/toolkit/iaf_util.h"
#include "/d/toolkit/dbutil.h"

void message(const char *s);

SitePage::SitePage()
{
   id = 0;
   siteID = 0;
    categorized = FALSE;
}

void SitePage::loadCategories()
{
   DWORD interestID;
   Cursor c;
   c.bind(SQL_C_LONG, &interestID, sizeof(interestID));
   char sql[1024] = "select interests_id from page_categories where page_id=";
   addValue(sql, id, FALSE);
   strcat(sql, " union all select interests_id from site_categories where site_id=");
   addValue(sql, siteID, FALSE);
   c.exec(sql);
   while( c.fetchNext() ) {
      categories.Add(interestID);
   }
}

extern BOOL defaultAdsMode;

SitePage* SitePage::lookupPage(Database& db, const char *from, const char *requestHdr)
{
   // from key format: sitekey/docname
   if( from == 0 )
      return 0;

   if( strnicmp(from, "www.", 4) == 0 )
      from += 4;

   if( *from == 0 )
      return 0;
   const char *q = strchr(from, '/');
   if(  q == 0 || strlen(from) > 75 )
      return 0;

   CString key;
   {
      // truncate a unique number from the end of the key
      const char *lastSlash = strrchr(q + 1, '/');
      if( lastSlash && isdigit(lastSlash[1]) )
         key = CString(from, lastSlash - from);
      else
         key = from;
      if( key.GetLength() > 64 )
         key = key.Left(64);  // truncate to column width
   }

   SitePage *p = new SitePage;

   {
      Cursor c(db);
      c.bind(SQL_C_LONG, &p->id, 4);
      c.bind(SQL_C_LONG, &p->siteID, 4);
      c.bind(SQL_C_LONG, &p->categorized, 4);
      char sql[1024] =
         "select id,site,categorized from sitepages where keyname=";
      addValue(sql, key, FALSE);
      c.exec(sql);
      if( c.fetchNext() ) {
         return p;
```

```
      }
   }

   // Didn't find the page.  Add page if site is correct.
   {
      CString siteKey(from, q - from);
      int approved = 0;
      Cursor c(db);
      c.bind(SQL_C_LONG, &p->siteID, sizeof(p->siteID));
      c.bind(SQL_C_LONG, &approved, sizeof(approved));
      CString sql = "select id,approved from sites where keyname='";
      sql += siteKey + '\'';
      c.exec(sql);
      if( c.fetchNext() ) {
         if( approved == 0 ) {
            message( CString("unapproved site: ") + from );
         }
         else {
            p->add(db, key);
         }
      }
      else {
         delete p;
         p = 0;
         if( !defaultAdsMode )
            message( CString("unknown site: ") + from );
      }
   }

   return p;
}

void SitePage::add(Database& db, const char *keyname)
{
   char buf[512] = "insert sitepages(junk, keyname, site, categorized) values('',";
   addValue(buf, keyname);
   addValue(buf, (int) siteID);
   addValue(buf, (int) categorized, FALSE);
   strcat(buf, ")");
   if( db.exec(buf) != 1 ) {
      TRACE("error adding sitekey\n");
      CString s = "sql: ";
      s += buf;
      ASSERT(FALSE);
      TRACE(s);
      message(s);
   }

   Cursor c(db);
   id = 0;
   c.bind(SQL_C_LONG, &id, 4);
   strcpy(buf, "select id from sitepages where keyname=");
   addValue(buf, keyname, FALSE);
   c.exec(buf);
   if( !c.fetchNext() ) {
      ;
   }
}
```

```
// ad.cpp
//

#include "stdafx.h"
#include <strstrea.h>
#include <fstream.h>
#include "winsock.h"
#include "objects.h"
#include "/d/toolkit/iaf_util.h"
#include "/d/toolkit/db.h"
#include "/d/toolkit/dbutil.h"
#include "/d/derive/sqlderive.h"
#include "/d/newderive/alg.h"
#include "rememberad.h"

const CString gifsRootDir = "c:\\ian\\ads\\";

#if !defined(_DERIVE)
int nAds() { return ads.GetSize(); }
#endif

extern Database iafmain;

//---------------------------------------------------------------------------
// Ad

Ad::~Ad()
{
   delete[] locations;
   delete[] sicCodes;
}

Ad::Ad(const Ad& ad) :
   started(ad.started),
   id(ad.id), fileName(ad.fileName), jumpTo(ad.jumpTo),
   type(ad.type), os(ad.os), browser(ad.browser),
   domainType(ad.domainType), isp(ad.isp),
   maxImpressions(ad.maxImpressions), nShown(ad.nShown),
   nLocations(ad.nLocations), nSICCodes(ad.nSICCodes),
   frequency(ad.frequency), imageSeries(ad.imageSeries),
   seriesNext(ad.seriesNext), startTime(ad.startTime), endTime(ad.endTime),
   si(ad.si), flags(ad.flags),
   hoursOfDay(ad.hoursOfDay), daysOfWeek(ad.daysOfWeek),
   nEmployees(ad.nEmployees), salesVolume(ad.salesVolume),
   gender(ad.gender), adDescription(ad.adDescription),
   maxAmount(ad.maxAmount), szPONumber(ad.szPONumber),
   active(ad.active), includeSites(ad.includeSites),
   includePages(ad.includePages), approved(ad.approved),
   nJumps(ad.nJumps)
{
   stripSpaces(fileName);
   stripSpaces(jumpTo);

   locations = 0;
   if( nLocations ) {
      locations = new Region[nLocations];
      for( int i = 0; i < nLocations; i++ ) {
         locations[i] = ad.locations[i];
      }
   }

   sicCodes = 0;
   if( nSICCodes ) {
      sicCodes = new SICCode[nSICCodes];
      for( int i = 0; i < nSICCodes; i++ ) {
         sicCodes[i] = ad.sicCodes[i];
      }
   }
}

void Ad::calcSI()
{
   if( maxImpressions == 0 )
      return;
```

```
   time_t t;
   DWORD totalSpan = endTime - startTime;
   if( totalSpan == 0 )
      totalSpan = 1;
   DWORD span = time(&t) - startTime; if( span == 0 ) span = 1;

   si =
   (DWORD) (((double) nShown /
      ((double) span / totalSpan) /
      maxImpressions) * 1000);
}

void Ad::shown()
{
   nShown++;

// if( nShown % 8 == 0 ) {
//    // update SI
//    calcSI();
// }
}

Ad::Ad()
{
   daysOfWeek = 0x7f;
   started = FALSE;
   flags = Production | SpreadEvenly;
   si = 1100;
   sicCodes = 0;
   nSICCodes = 0;
   frequency = 0;
   imageSeries = FALSE;
   id = 0;
   maxImpressions = 0;
   nShown = 0;
   nJumps = 0;
   type = Normal;
   nLocations = 0;
   locations = 0;
   gender = 0;
   maxAmount = 0;
   active = 0;
   approved = 0;
   includePages = 0;
   includeSites = 0;
   startTime = 0;
   endTime = 0;
   os = DefaultMask;
   browser = DefaultMask;
   domainType = DefaultMask;
   isp = DefaultMask;
   hoursOfDay = 0xffffff;
   nEmployees = DefaultMask;
   salesVolume = DefaultMask;
   gender = DefaultMask;
   seriesNext = 0;
}

CString Ad::getFileName()
{
   if( !imageSeries || seriesNext <= 1 )
      return fileName;

   char buf[256];
   wsprintf(buf, "%s%d.gif", (const char *) fileName.Left( fileName.GetLength() - 4), seriesNe
   return buf;
}

CString Ad::fullName()
{
   return gifsRootDir + getFileName();
}

#if !defined(_ADSVR)
```

```
BOOL Ad::Book( DWORD advertiserID )
{
   char buf[1024];
   char szTime[ 10 ];

   if (!advertiserID)
   {
      ASSERT( 0 );
      return( FALSE );
   }

   //
   // If this is a barter ad, set max_impressions = to 1
   if (type == Barter)
   {
       maxImpressions = 1;
   }

   strcpy( buf, "insert placements(jumpto,max_impressions,type,os,browser,domainType,isp,frequ"
          "image_series,advertiser,flags,hours_of_day,days_of_week,employees,sales,descri"
               "max_amount,po_number,gender,active,approved,filename" );
   if (startTime)
      strcat( buf, ",start_time" );

   if (endTime)
      strcat( buf, ",end_time" );

   strcat( buf, ") values(" );

   addValue( buf, jumpTo );
   addValue( buf, maxImpressions );
   addValue( buf, type );
   addValue( buf, os );
   addValue( buf, browser );
   addValue( buf, domainType );
   addValue( buf, isp );
   addValue( buf, frequency );
   addValue( buf, imageSeries );
   addValue( buf, advertiserID );
   addValue( buf, flags );
   addValue( buf, hoursOfDay );
   addValue( buf, daysOfWeek );
   addValue( buf, nEmployees );
   addValue( buf, salesVolume );
   addValue( buf, adDescription );
   addValue( buf, maxAmount );
   addValue( buf, szPONumber );
   addValue( buf, gender );
   addValue( buf, active );
   addValue( buf, approved );
   addValue( buf, fileName, FALSE );

   if (startTime)
   {
      strftime( szTime, 9, "%m/%d/%y", gmtime( &startTime ) );
      strcat( buf, "," );
      addValue( buf, szTime, FALSE );
   }

   if (endTime)   |
   {
      strftime( szTime, 9, "%m/%d/%y", gmtime( &endTime ) )
      strcat( buf, "," );
      addValue( buf, szTime, FALSE );
   }

   strcat( buf, ")" );

   if (!afmain.exec( buf ) != 1)
   {
      ASSERT( 0 );
      return( FALSE );
   }

   //
```

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```
   // Get the ID of the newly added ad
   int    adID = 0;
   {
      Cursor   c;
      c.bind( SQL_C_LONG, &adID, 4 );
      strcpy( buf, "select max(id) from placements" );
      c.exec( buf );
      c.fetchNext();
      !afmain.commit();
   }

   if (!adID)
   {
      ASSERT( 0 );
      return( FALSE );
   }

   return( AddPlacementTables( adID ) );
}

BOOL Ad::Update()
{
   //
   // To update an ad, we delete the existing ad
   // and re-book it.
   if (Remove( FALSE ))
   {
      //
      // Pe-determine if the ad is targeted
      double dPerAdCost = CalculateCostPerAd();
      if (dPerAdCost == BASE_AD_COST)
      {
         flags ^= Ad::Targeted;
      }
      else
      {
         flags |= Ad::Targeted;
      }

      char buf[1024];
      char szTime[ 10 ];

      strcpy( buf, "update placements set " );

      //
      // Don't update max_impressions if this is a barter ad.  REP.EXE
      // credits the placement so we don't want to overwrite the
      // barter credits
      if (type != Barter)
      {
         strcat( buf, "max_impressions=" );     addValue( buf, maxImpressions );
      }
      strcat( buf, "jumpto=" );              addValue( buf, jumpTo );
      strcat( buf, "type=" );                     addValue( buf, type );
      strcat( buf, "os=" );                       addValue( buf, os );
      strcat( buf, "browser=" );                  addValue( buf, browser );
      strcat( buf, "domainType=" );               addValue( buf, domainType );
      strcat( buf, "isp=" );                      addValue( buf, isp );
      strcat( buf, "frequency=" );                addValue( buf, frequency );
      strcat( buf, "image_series=" );             addValue( buf, imageSeries );
      strcat( buf, "flags=" );                    addValue( buf, flags );
      strcat( buf, "hours_of_day=" );             addValue( buf, hoursOfDay );
      strcat( buf, "days_of_week=" );             addValue( buf, daysOfWeek );
      strcat( buf, "employees=" );                addValue( buf, nEmployees );
      strcat( buf, "sales=" );                    addValue( buf, salesVolume );
      strcat( buf, "description=" );              addValue( buf, adDescription );
      strcat( buf, "max_amount=" );               addValue( buf, maxAmount );
      strcat( buf, "po_number=" );                addValue( buf, szPONumber );
      strcat( buf, "gender=" );                   addValue( buf, gender );
      strcat( buf, "active=" );                   addValue( buf, active );
      strcat( buf, "approved=" );               addValue( buf, approved );
      strcat( buf, "filename=" );               addValue( buf, fileName );

      strcat( buf, "start_time=");
      if (startTime)
      {
         strftime( szTime, 9, "%m/%d/%y", gmtime( &startTime ) );
         addValue( buf, szTime );
      }
      else
      {
         strcat( buf, "(null)," );
      }

      strcat( buf, "end_time=");
      if (endTime)
      {
         strftime( szTime, 9, "%m/%d/%y", gmtime( &endTime ) );
         addValue( buf, szTime, FALSE );
      }
      else
      {
         strcat( buf, "(null)" );
      }

      strcat( buf, "where id=" );
      addValue( buf, id, FALSE );

      if (iafmain.exec( buf ) != 1)
      {
         ASSERT( 0 );
         return( FALSE );
      }

      return( AddPlacementTables( id ) );
   }

   return( FALSE );
}

BOOL Ad::AddPlacementTables( DWORD adID )
{
   char buf[1024];
   BOOL bRc = TRUE;

   while (TRUE)
   {
      ////////////////////////////////////////////////////////////////////
      // Now save the locations to the "placement_locations" table
      ////////////////////////////////////////////////////////////////////
      for (int nLoop = 0; nLoop < nLocations; nLoop++)
      {
         strcpy( buf, "insert placement_locations(" );

         if (locations[nLoop].country)
            strcat( buf, "country," );
         if (!locations[nLoop].state.IsEmpty())
            strcat( buf, "state," );
         if (!locations[nLoop].zipCode.IsEmpty())
            strcat( buf, "zipcode," );
         if (locations[nLoop].areaCode)
            strcat( buf, "areacode," );

         strcat( buf, "ad_id) values(" );

         if (locations[nLoop].country)
            addValue( buf, locations[nLoop].country );
         if (!locations[nLoop].state.IsEmpty())
            addValue( buf, locations[nLoop].state );
         if (!locations[nLoop].zipCode.IsEmpty())
            addValue( buf, locations[nLoop].zipCode );
         if (locations[nLoop].areaCode)
            addValue( buf, locations[nLoop].areaCode );

         addValue( buf, adID, FALSE );
         strcat( buf, ")" );

         if (iafmain.exec( buf ) != 1)
         {
            ASSERT( 0 );
```

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```
            bRc = FALSE;
            break;
         }
      }
      ////////////////////////////////////////////////////////////////////
      // Now save the SICs to the "placement_sics" table
      ////////////////////////////////////////////////////////////////////
      for (nLoop = 0; nLoop < nSICCodes; nLoop++)
      {
         wsprintf( buf, "insert placement_sics(ad_id,siccode) values(%d,'%s')",
                   adID, sicCodes[ nLoop ].asText() );

         if (iafmain.exec( buf ) != 1)
         {
            ASSERT( 0 );
            bRc = FALSE;
            break;
         }
      }

      ////////////////////////////////////////////////////////////////////
      // Now save the site categories to the placement_sitecats table
      ////////////////////////////////////////////////////////////////////
      POSITION pos = siteCategories.GetStartPosition();
      DWORD    dwInterestID;
      BOOL     bJunk;
      while (pos)
      {
         siteCategories.GetNextAssoc( pos, dwInterestID, bJunk );

         wsprintf( buf, "insert placement_sitecats(ad_id,interest_id) values(%d,%d)",
                   adID, dwInterestID );

         if (iafmain.exec( buf ) != 1)
         {
            ASSERT( 0 );
            bPc = FALSE;
            break;
         }
      }

      ////////////////////////////////////////////////////////////////////
      // Now save the user interests to the placement_interests table
      ////////////////////////////////////////////////////////////////////
      pos = interests.GetStartPosition();
      while (pos)
      {
         interests.GetNextAssoc( pos, dwInterestID, bJunk );

         wsprintf( buf, "insert placement_interests(ad_id,interest_id) values(%d,%d)",
                   adID, dwInterestID );

         if (iafmain.exec( buf ) != 1)
         {
            ASSERT( 0 );
            bRc = FALSE;
            break;
         }
      }

      ////////////////////////////////////////////////////////////////////
      // Now save site include-exclude list in the placement_sites table
      ////////////////////////////////////////////////////////////////////
      pos = targetSites.GetStartPosition();
      DWORD dwSiteID;
      while (pos)
      {
         targetSites.GetNextAssoc( pos, dwSiteID, bJunk );

         wsprintf( buf, "insert placement_sites(ad_id,site_id,include) values(%d,%d,%d)",
                   adID, dwSiteID, includeSites );

         if (iafmain.exec( buf ) != 1)
         {
            ASSERT( 0 );
            bRc = FALSE;
            break;
         }
      }

      ///////////////////////////////////////////////////////////////////
      // Now save site page include-exclude list in the placement_sites table
      ///////////////////////////////////////////////////////////////////
      pos = targetPages.GetStartPosition();
      DWORD dwPageID;
      while (pos)
      {
         targetPages.GetNextAssoc( pos, dwPageID, bJunk );

         wsprintf( buf, "insert placement_pages(ad_id,page_id,include) values(%d,%d,%d)",
                     adID, dwPageID, includePages );

         if (iafmain.exec( buf ) != 1)
         {
            ASSERT( 0 );
            bRc = FALSE;
            break;
         }
      }

      break;
   }

   iafmain.commit();
   return( bRc );
}

BOOL Ad::Remove( BOOL bRemoveFromPlacements )
{
   char buf[1024];
   BOOL bRc = TRUE;

   while (TRUE)
   {
      ///////////////////////////////////////////////////////////////////
      // Delete locations from the "placement_locations" table
      ///////////////////////////////////////////////////////////////////
      wsprintf( buf, "delete placement_locations where ad_id=%d", id );
      if (iafmain.execErrOK( buf ) != 0)
      {
         ASSERT( 0 );
         bRc = FALSE;
         break;
      }

      ///////////////////////////////////////////////////////////////////
      // Delete the SICs from the "placement_sics" table
      ///////////////////////////////////////////////////////////////////
      wsprintf( buf, "delete placement_sics where ad_id=%d", id );
      if (iafmain.execErrOK( buf ) != 0)
      {
         ASSERT( 0 );
         bRc = FALSE;
         break;
      }

      ///////////////////////////////////////////////////////////////////
      // Delete the site categories from the placement_sitecats table
      ///////////////////////////////////////////////////////////////////
      wsprintf( buf, "delete placement_sitecats where ad_id=%d", id );
      if (iafmain.execErrOK( buf ) != 0)
      {
         ASSERT( 0 );
         bRc = FALSE;
         break;
      }

      ///////////////////////////////////////////////////////////////////
      // Delete the user interests from the placement_interests table
```

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```
      ///////////////////////////////////////////////////////////////////
      wsprintf( buf, "delete placement_interests where ad_id=%d", id );
      if (iafmain.execErrOK( buf ) != 0)
      {
         ASSERT( 0 );
         bRc = FALSE;
         break;
      }

      ///////////////////////////////////////////////////////////////////
      // Delete the site include-exclude list from the placement_sites table
      ///////////////////////////////////////////////////////////////////
      wsprintf( buf, "delete placement_sites where ad_id=%d", id );
      if (iafmain.execErrOK( buf ) != 0)
      {
         ASSERT( 0 );
         bRc = FALSE;
         break;
      }

      ///////////////////////////////////////////////////////////////////
      // Delete the site page include-exclude list from the placement_sites table
      ///////////////////////////////////////////////////////////////////
      wsprintf( buf, "delete placement_pages where ad_id=%d", id );
      if (iafmain.execErrOK( buf ) != 0)
      {
         ASSERT( 0 );
         bRc = FALSE;
         break;
      }

      if (bRemoveFromPlacements)
      {
         ///////////////////////////////////////////////////////////////////
         // Lastly, delete the placement from the placements table
         ///////////////////////////////////////////////////////////////////
         wsprintf( buf, "delete placements where id = %d", id );
         if (iafmain.execErrOK( buf ) != 0)
         {
            ASSERT( 0 );
            bRc = FALSE;
            break;
         }
      }
      break;
   }

   iafmain.commit();
   return( bRc );
}

void Ad::Reset()
{
   daysOfWeek = 0x7f;
   flags = Production | SpreadEvenly;
   frequency = 0;
   imageSeries = FALSE;
   maxImpressions = 0;
   type = Normal;
   domainType = 0;
   gender = 0;
   maxAmount = 0;
   szPONumber.Empty();
   startTime = 0;
   endTime = 0;
   os = DefaultMask;
   browser = DefaultMask;
   domainType = DefaultMask;
   isp = DefaultMask;
   hoursOfDay = 0xffffff;
   nEmployees = DefaultMask;
   salesVolume = DefaultMask;
   gender = DefaultMask;
   includePages = 0;
   includeSites = 0;
```

```
    seriesNext = 0;

    delete [] sicCodes;
    nSICCodes = 0;
    sicCodes = NULL;

    delete [] locations;
    nLocations = 0;
    locations = NULL;

    targetPages.RemoveAll();
    targetSites.RemoveAll();
    siteCategories.RemoveAll();
    interests.RemoveAll();

    adDescription.Empty();
    fileName.Empty();
    jumpTo.Empty();
}

#endif
```